ADJUSTED MEASURES OF DISTRICT AND SCHOOL PERFORMANCE: A SOCIAL JUSTICE STUDY OF COLORADO'S LATINO STUDENTS

by

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ABSTRACT

The reauthorization of the No Child Left Behind Act of 2001 has increased attention to student achievement. Specifically, the challenging demographics in Colorado make attention to Colorado's Latino American students a critical issue. Colorado's population of Latino American students is now the largest and fastest growing ethnic minority group in the state. Although it is necessary to hold educators accountable for students who are not achieving, it is inappropriate to make judgments simply from raw test scores. Given that educators can only control the school system, it makes sense to concentrate energies here.

This quantitative study was designed using Adjusted Performance Measures (APM) to determine whether Colorado school districts and secondary schools were performing at predicted levels. APM allow researchers to control for factors beyond districts' power, while holding districts accountable for factors within their power. The first part is a district-level analysis, comparing the 178 school districts in Colorado. Secondary schools within two metro-area school districts are compared in the second part of the study.

Once the APM were determined, the Educational Quality inputs were compared between the highest and lowest performing districts and schools. Conclusions were drawn for all Colorado students with additional emphasis on Latino Students.

This abstract accurately represents the content of the candidate's thesis. I recommend its publication.

Signed [redacted]

Rodney Muth

DEDICATION PAGE

My completed dissertation is dedicated to my husband, Chad. His love gave me the courage to persevere while he provided me with the time needed to complete this degree. Over the past three years, many moments have been postponed so I may achieve this goal. Now, at the conclusion of this process, I look forward to focusing on new ambitions. Thank you for believing in me.

Additionally, this dissertation is dedicated to my parents, Harry and Julee Raduege. My parents have always believed in the power and importance of education. They chose to raise an open-minded and determined daughter even though it often proved to be more challenging. Thank you for the foundation from which I have built my life.

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I would also like to thank Mountain View Public Schools for believing in the value of my research. Having access to the data elements contributed greatly to the depth of my study.

Finally, I would like to acknowledge the many people who played a role in my getting to this point. Specifically, I would like to express my gratitude to Marcia Muth for offering writing workshops and providing structure through the dissertation process. Also, having a group of colleagues to share the doctoral experience has been invaluable. I would like to thank Paula Gallegos and Kristen Kaiser Atwood, in particular, for their encouragement.

TABLE OF CONTENTS

LIST OF FIGURES

Figure

LIST OF TABLES

CHAPTER 1

INTRODUCTION

In June 2003, the United States Census Bureau reported that Latino Americans had become the nation's largest minority group with 38.8 million people, surpassing Black Americans by half a million people (Cavanagh & López, 2004; Chapa & Rosa, 2004). Additionally, the United States Latino American population is a very young population. More than 33% of Latino Americans are under the age of 18, compared with only about 25% of the non-Latino American population (Chapa & Rosa, p. 136). Currently, 14.4% of White Americans are 65 years old and older, while only 5.1% of Latino Americans are in the same age range (U.S. Census Bureau, 2003). These statistics indicate that the Latino American population will continue increasing over time while the White American population decreases. As this population shift transpires and Latino Americans' financial base becomes more secure, the contribution to the American economy and society in general will grow.

Critical Attention Needed

Attention to Colorado's Latino American students is critical. Colorado's population of Latino American students is now the largest and fastest growing ethnic minority group in the state (Besnette & Schoales, 2004; Hernandez & Nesman, 2004; Suro, 1999; Tatum, 2003; Weiner et al., 2000). Since 1990, the Latino American population has increased by more than 57%, increasing almost 10% alone between 2000 and 2002 (Chapa & Rosa, 2004). According to the October 2004 count in Colorado (see Table 1.1), 201,016 Latino American students, 45,127 Black American students, and 487,056 White American students were enrolled in Colorado schools (Colorado Department of Education, 2004).

In relation to the other ethnic groups (see Table 1.2), Latino American students increased by 8.6% since the 1994 count and the Black American population increased by 0.5%, whereas White American students decreased by 10% (Colorado Department of Education). By 2020, Latino Americans are expected to make up 20% of all United States children (Weiner et al.). If current trends continue, Black and Latino American students will become the majority in Colorado schools.

Study Rationale

First, studying this population is critical because today they may be an underserved minority, but soon they will become an underserved majority of our

Table 1.1

Colorado Pupil Counts by Race/Ethnicity

Racial/Ethnic Group	Pupil Count October 2004	Pupil Count October 1994	Count Change 1994 to 2004	Percent Change 1994 to 2004	Pupil Count October 1984	Count Change 1984 to 2004	Percent Change 1984 to 2004
American Indian	9, 048	6,467	2,581	39.91%	3,816	5,232	137.11%
Asian American	24,410	15,956	8,454	52.98%	10,505	13,905	132.37%
Black American	45,127	34,425	10,702	31.09%	25,384	19,743	77.78%
Latino American	201,016	112,890	88,126	78.06%	81,371	119,645	147.04%
White American	487,056	470,783	16,273	3.46%	424,351	62,705	14.78%
Total	766,657	640,521	126,136	19.69%	545,427	221,230	40.56%

Note. From *Colorado Student Assessment Program* (Denver Public Schools, 2004).

population. By increasing the achievement levels for Latino American youth, educators will increase the achievement of America's schools and may even produce more adequate educational experiences for other traditionally marginalized populations as well.

Second, improving Latino American students' success in school is important for their personal economic well-being. It should be no surprise that individuals who achieve higher levels of education will make more money in their lifetimes. Of White Americans, 82.8% have at least a high school diploma compared to only 53.1% of Latino Americans (see Table 1.3). According to the

Table 1.2

Percent of Colorado Pupils by Race/Ethnicity

Racial/Ethnic Group	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	% Change 1994-2004
American Indian	1.0%	1.1%	1.1%	1.1%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%	+.2%
Asian American	2.5%	2.6%	2.6%	2.7%	2.7%	2.8%	2.9%	3.0%	3.0%	3.1%	3.2%	+.7%
Black American	5.4%	5.4%	5.5%	5.6%	5.6%	5.7%	5.7%	5.7%	5.7%	5.8%	5.9%	+.5%
Latino American	17.6%	18.4%	18.8%	19.3%	19.9%	20.8%	22.0%	23.3%	24.3%	25.3%	26.2%	+8.6%
White American	73.5%	72.5%	72.0%	71.3%	70.6%	69.5%	68.2%	66.8%	65.7%	64.5%	63.5%	-10%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	

Note. From *Colorado Student Assessment Program* (Denver Public Schools, 2004).

Table 1.3

Education Attainment by People 25 Years and Older

Racial/Ethnic Group	High School Graduate	Some College, No Degree	Bachelor's Degree Or Beyond	Total Graduates High School Or Beyond
Black American	35.1%	25.5%	13.6%	74.3%
Latino American	26%	17.9%	9.3%	53.1%
White American	33.9%	24.6%	24.3%	82.8%

Note. From *Population Profile of the United States: 1997* (U.S. Bureau of the Census, 1998).

U.S. Bureau of the Census (1998), in 1997 Latino American households had a median income of $22,860 compared to White American households with a median income of $35,766 (see Table 1.4). In fact, Latino Americans are more than twice as likely as non-Latino Americans to live in poverty (Chapa & Rosa, 2004).

Third, because Latino Americans represent such a large and growing percentage of the United States' population, their overall economic welfare affects our entire society. At this point, children from immigrant families are more likely than others to live in poverty, lag behind academically, and live in overcrowded housing (Sadowski, 2004). If these numbers do not shift as the population

Table 1.4

Median Household Income by Race

Racial/Ethnic Group	1988	1989	1994	1995
Black American	$21,136	$22,225	$21,623	$22,393
Latino American	$26,227	$26,942	$24,085	$22,860
White American	$37,077	$37,370	$34,992	$35,766

Note. From *Population Profile of the United States: 1997* (U.S. Bureau of the Census, 1998).

increases, the entire country will bear the consequences of these circumstances. Finally and most importantly, focusing attention on a marginalized and currently underserved population with the end result of increasing their educational opportunities and successes is the right and moral thing to do. I fully realize that some individuals do not agree with my value set and have arguments supporting their own values. Although I respect their right to believe differently, I will not acknowledge these arguments in my study.

An Achievement Gap

In the United States, an achievement gap exists between students of color and their White American peers. Graduating Latino American twelfth grade

students' reading skills are basically the same as White American 8th graders' reading skills (Olson, 2005a). On the 2002 Colorado Student Assessment Program (CSAP), 73% of White American students but only 37% of Latino American students scored either proficient or advanced (Colorado Children's Campaign, 2005). Similar to the vast differences in CSAP scores, a disparity is apparent in the types of courses completed by Latino American students and White American students. For example, of the Latino American students graduating from Denver high schools in 2003, only 29% had completed the coursework necessary to attend college (Hayes & Polis, 2005).

Because an achievement gap has been identified through course selections and test scores, policies need to be adjusted to address these issues. On a very basic level, two approaches of reform exist: change the student or transform the system. Traditionally, when discussing problems such as the achievement gap, the focus has been on "fixing" the student, rather than changing the school system. Furthermore, researchers have often measured whether inputs are equal among schools and school districts (Archer, 2005; Bainbridge, 2003; Darling-Hammond, 2003; Santos, 2004). By inputs, I am referring to system-controllable factors such as revenue allocations, personnel allotment and assignment, and so forth. Currently it is more likely to find studies measuring outputs, often by measuring student performance.

Shifting Policies

Policy sets the context for districts, schools, administrators, and teachers to educate students. By studying policy, it is easier to understand the current reality of education. This study is a vehicle to establish whether the current reality in Colorado's schools is conducive to Latino American students' academic success. Academic success, for the purpose of this study, is measured by students who demonstrate their learning by earning scores of either advanced or proficient on the CSAP test. The findings may provide powerful tools from which to design future, more far-reaching studies.

Given that educators can only control the school system, it makes sense to concentrate energies here. Programs and reforms focusing on student-centered issues have a tendency to fail because educators have limited influence on these factors (Flannery & Jehlen, 2005; Haycock, 2001; López, 2001; Montecel, Cortez, & Cortez, 2004; Shreffler, 1998; West, 1993). To be accountable and responsible for all students, educators need to identify interventions and develop effective strategies to address what needs to be done differently in classrooms and schools (Montecel et al.; Reid, 2004).

The Model Fit

Determining and selecting the most appropriate model for any study is critical. For this study, adopting the Adjusted Performance Measure (APM) model

made sense. Measuring district and school performance is a fairly simple approach using the APM model.

The basic premise of the model is to use residuals, from multiple regression equations, as quantifiable measurements in district and school performance. For the regression equations, the dependent variables were CSAP test scores and the independent variables included a variety of factors both within and beyond the influence of the districts and schools. The beyond-influence factors were adjusted for through the regression equation to focus the findings on the areas within the scope of impact of districts and schools.

The APM model calculates "the difference between the actual [district or] school output and the output predicted from the regression equation, or the estimated residual from the regression" (Stiefel, Schwartz, Rubenstein, & Zabel, 2005, p.18). This quantified performance data provides valuable information in identifying differences between high performing districts and schools and those not performing as well.

The information gathered from using the APM model is tied to student achievement and provides valuable data for the social justice movement. Once accurate determinations of how educators can best support achievement for all students is made, these recommendations can be a mandatory minimum for *all* districts and schools, rather than only applying to the institutions with the resources to demand it.

Study Introduction

Determining whether districts serving Latino American students are performing at predicted levels, based upon educational quality inputs, is the focus of my dissertation. Currently, Latino American students perform at lower levels than their White American peers (Colorado Children's Campaign, 2005; Hayes & Polis, 2005; Olson, 2005a). Equity issues focus on like *inputs* available to all students (Ladd & Hansen, 1999; Stiefel et al., 2005). On the other hand, adequacy issues focus on like *outputs* (Ladd & Hansen). Adequacy could be illustrated as the potential to bestow unequal inputs to achieve equal outcomes (Ladd & Hansen).

Examining APM at the district and school levels provides additional information in the quest to increase educational opportunities for all students. No Child Left Behind (NCLB) has increased attention to and scrutiny of the performance of all students. Recently, reported dropout rates have been questioned across the nation. In contrast, the school accountability data and dropout statistics showing Latino American students and schools serving Latino American students, performing at far lower levels, is not being disputed. In Chapter 2, these issues are addressed in greater depth.

Another intention of the study is to eliminate variables that some individuals consider key differences in education, while unearthing injustices in areas of authentic inadequacy. The design of this study was grown from a social justice lens. Social justice is a topic often explored through qualitative methods. I

have chosen the less typical path of delving into social justice through a quantitative study of Colorado's districts and schools.

Theoretical Framework

As stated earlier, seeking to determine if Latino American students are performing at predicted levels based upon districts' inputs is the focus of my dissertation. Three logical perspectives to frame this study include (a) the legal basis for adequate education, (b) a financial focus which analyzes capacity or adequacy, or (c) social justice. The chosen lens affects my analysis, interpretation, and final comments. While the first two perspectives are interesting and useful, the intent of this study is to target social justice. Because I found districts and schools serving larger populations of Latino American youth are performing below adequate levels when using Adjusted Performance Measures, the issue of social justice, as outlined in the following section, frames my recommendations for policy makers and future studies.

Looking Through the Social Justice Lens

Social justice is a process, a goal, and for many a vision of the way the world is meant to be (Bell, 1997). Achieving social justice means creating and maintaining a society that equally includes all groups in a system that continually meets the needs of all participants (Bell; Neal & Moore, 2004). A socially just system has an adequate distribution of resources and power. Maximizing society's

capacity to meet the needs of the whole society, while providing opportunities for all individuals to realize and achieve their fullest potential, are basic principles of a socially just system (Goodman, 2001; Parsons & Smelser, 1956). Further, social justice allows all individuals to live with dignity in a safe and secure environment (Bell; Denver Commission on Secondary School Reform, 2005; Goodman; Walters, 1998).

Social justice means that all individuals have prospects for like opportunities (Tatum, 2000). It constitutes the ability to send all children to a school where they may be educated in a way that allows them choices for their future (Dodson, 1993a). It is the expectation that each child may have a life full of opportunities, free of marginalization (Dodson, 1993b).

Appreciating the Complexity

The positions of privilege for some and marginalization for others is intricately woven into society (Bell, 1997). Human nature perpetuates this cycle by allowing individuals and groups to uphold systems that support their best interests, even if others are disadvantaged (Bell; Blanchett, Brantlinger, & Shealey, 2005; Goodlad, 2003). Further, individuals tend to place higher standards and expectations on others than they are willing to place upon themselves (Blanchett et al.). Because human nature allows individuals to view others' needs as less important than their own, a rational argument is created to serve first personal

interests and interests that will benefit groups to which one belongs before the interests of others (Blanchett et al.; Jost, Pelham, Sheldon, & Sullivan, 2003).

People often accept a hierarchal class structure that sorts others based upon their ethnicity, religion, or economic situation (Blanchett et al., 2005). Conversely, many people believe that all people should be treated equally (Blanchett et al.). Clearly, these two statements produce conflicts between how one may truthfully view the world and how one believes one should view the world.

Believing in social justice requires recognizing issues of adequacy, power, and oppression exist (Goodman, 2001). For many privileged individuals, simply admitting that positions of advantage exist in society is difficult because, by this admission, the implication is clear that positions of disadvantage, non-privilege, and marginalization also exist (Goodman; Tatum, 2000).

Involving the Privileged

Unquestionably, marginalized individuals must struggle for their own interests and not leave the fight to someone else (Concern America, 2005; Freire, 1989). Whereas many privileged individuals may choose to continue the cycle of marginalization, other members of the dominant culture want to stop it (Goodman, 2001). The inclusion of privileged individuals is of great value because they may have access to resources, information, and most importantly the voice and the power to help others listen (Goodman).

In order for social justice to prevail, enough people must recognize the inadequacy and commit to making it known to others (Blanchett et al., 2005). In fact, people generally must become uncomfortable with the current system in order to be willing to go through the effort required to make changes (Heifetz, 2000). Often to create enough energy to make change happen, a pressure-cooker environment must occur to force people to recognize the ineffectiveness of the current situation (Heifetz). By allowing a situation to escalate to the point of an uncomfortable simmer, all players become engaged in the process by acknowledging the need for changes to take place (Heifetz). The increased attention to the achievement gap between students of color and their White American peers, racial segregation in schools, and the large number of students not being well served by public education is fueling the pressure-cooker environment needed for social justice change to transpire (Blanchett et al.; Colorado Children's Campaign, 2005; Heifetz; Kozol, 2000; Tatum, 2003).

Empowering the Marginalized

Nevertheless, a truly powerful society is only possible through the development of its most marginalized people (Social Justice Education, 2005). As long as pockets of individuals are perpetually given less, expected to do without, or believed to be less important than other groups of people, society is constricted in ways that keep civilization from transcending its current conditions (Social Justice

Education). In this regard, social justice means not acting self-centeredly, but teaching people to help themselves (Concern America, 2005).

Education is the key to empowering individuals to lift themselves out of their current situation and take control of their own lives (Concern America, 2005; Freire, 1989). By empowering individuals to change their current reality, individuals are able to take control of their own lives rather than having a dominant group of individuals make changes for them, generally in ways that most likely are of benefit to the dominant group (Concern America; Freire).

In current society, education is arguably the best answer to affecting a more socially just society (Banks et al., 2001). If denied the opportunity to receive an education, people are unlikely to be successful in life (National Center for Public Policy Research, 2005). Education is a basic right for all children, and adequate resources, opportunities, and conditions should be available to all students, regardless of ethnicity, zip code, or economic status (National Center for Public Policy Research, 2005). This study seeks to determine if districts and schools are performing at adequate levels when controlling factors beyond the district and school control.

Study Implications

Because differences existed between expected outputs for districts and schools serving White American students and those serving Latino American

students, the findings were framed from a social justice perspective. "Education has long been viewed as the major route to a good society and to improving the life chances of individual citizens" (Ladd & Hansen, 1999, p. 67). This study was originated to determine if districts and schools serving Latino American students are performing at levels below other districts and schools. The findings demonstrated that additional inputs may improve Latino American student achievement, potentially enabling outputs competitive with their peers. Additionally, the findings from this study illustrate that some districts and schools serving Latino American students are performing at expected levels from the current inputs. For that reason, the case is made that additional inputs are required to produce an adequate level of education for Latino American students.

Study Overview

The study is divided into two main parts. The first part is a district-level analysis, comparing the 178 school districts in Colorado. The district-level analysis compares school districts based upon the district setting. District settings are defined by Colorado Department of Education (CDE) and include 15 metro area school districts, 15 urban-suburban school districts, 13 outlying city school districts, 49 outlying town school districts, and 86 rural school districts. The second part of the study compares secondary schools within two metro-area school districts.

Guiding Questions

This study was designed to answer two questions. The first question is the following: Using an adjusted performance measure, are school districts Latino American students' CSAP scores at predicted levels, based upon the districts' inputs? The seven categories of district inputs include (a) School Environment, (b) District Revenue Sources, (c) District Expenditures, (d) Teacher Quality, (e) Ratio of Students to Professionals, (f) Student Characteristics, and (g) Previous Year's Test Results. The second research question is the following: Using an adjusted performance measure, are school's Latino American students' CSAP scores at predicted levels, based upon the schools' inputs? The categories of school inputs include (a) Teacher Quality, (b) Ratio of Students to Professionals, (c) Leadership Experience, (d) Student Characteristics, and (e) Previous Year's CSAP Scores.

Clarifying the Variables

Because the study is rather large and includes many variables, Figure 1.1 and Figure 1.2 are included to depict visually the variables in the study and show their relationship with other variables. Figure 1.1 describes the district-level portion of the study, while Figure 1.2 represents the school-level portion of the study. Both figures are also included in Chapter 3, the methodology chapter, where they are referenced again.

District-Level Analysis

The district-level analysis included seven categorical indicators; all involving multiple variables (see Figure 1.1). The first indicator, School Environment, was measured through the retention of administrators, principals, classroom instructors, and instructional supporters. Teacher Quality, the second indicator, examined the average Years of Teaching Experience, percentage instructing in degree area, percentage of days absent, and Teacher Salary which correlates with educational degree level. The Ratio of Students to Professionals indicator was calculated to include ratios of students to teachers, administrators, and other professionals. The fourth indicator, Revenue Sources, was measured by comparing the percentage of total revenue from local revenue, state share, state Special Education funding, state English Language Learner funding, State Gifted and Talented funding, and federal revenue. The comparison of Per Pupil Revenues is also included in the fourth indicator. For the fifth indicator, Revenue Expenditures, the percentage of dollars spent for instructional purposes, support services purposes, and non-instructional purposes were compared. Student Characteristics, the sixth indicator, provides a measure of student need by determining the free and reduced lunch percentages, percentage of the population qualifying for special education services, and the percentage of students who are English Language Learners. The seventh indicator was the Previous

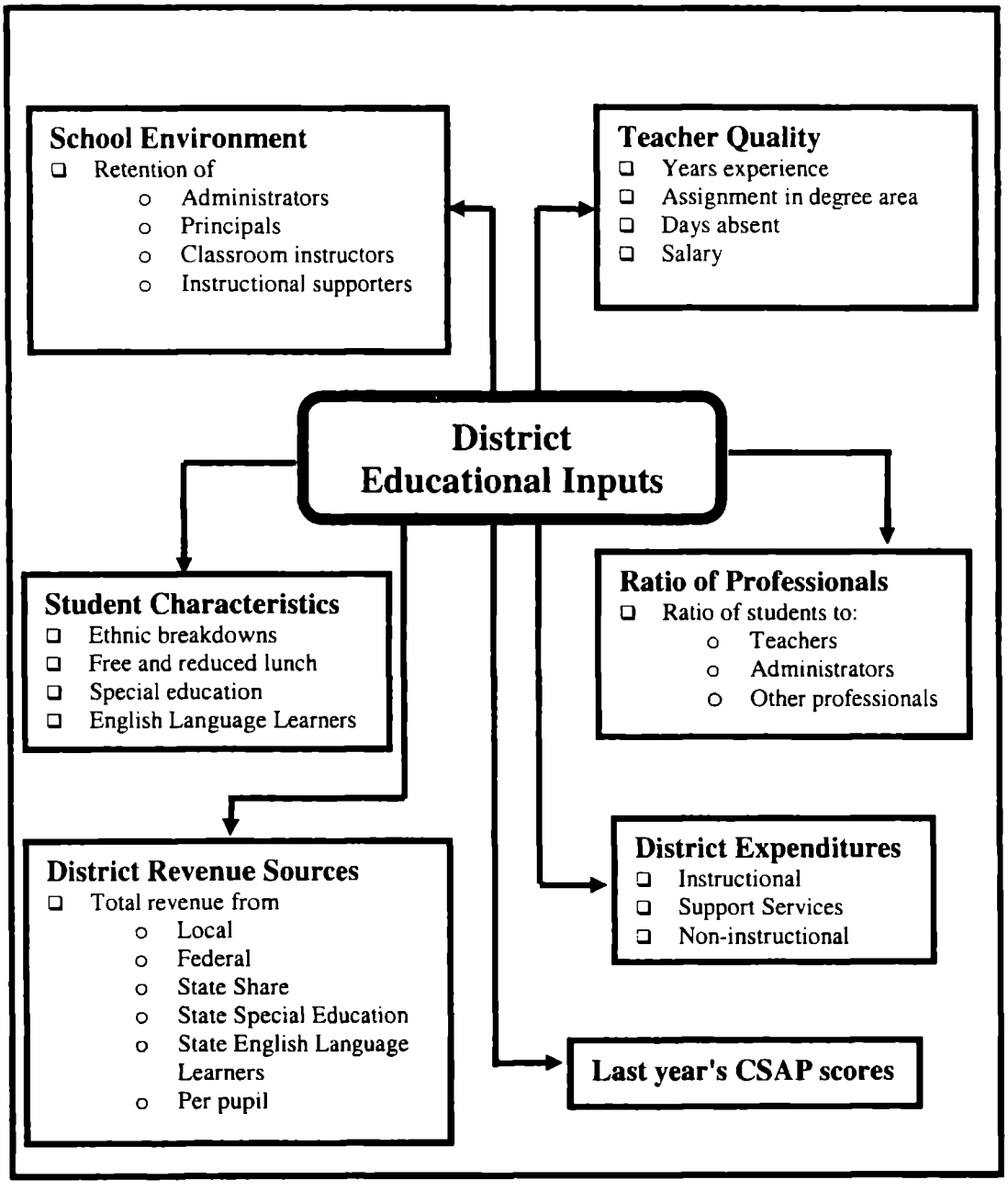

Figure 1.1. District-level educational input variables.

Year's CSAP Scores. This indicator was included as a baseline marker from which to measure the current CSAP scores, the outcome variable for my study.

School-Level Analysis

The second portion of the study was the school-level analysis (see Figure 1.2). Teacher Quality, the first indicator, was measured through average Years of Teaching Experience, percentage of instructors teaching in their degree area, percentage of days absent, percentage of teachers retained, and Teacher Salary. The second indicator, Ratio of Students to Professionals, was calculated by comparing the ratio of students to teachers, administrators, and counselors. The third indicator, Leadership Experience, was determined by comparing the number of years each building principal had been a principal and how long each had served at the current location. Similar to the district-level analysis, the fourth indicator, Student Characteristics, was included to provide a measure of student need by determining the free and reduced lunch percentages, percentage of the population qualifying for special education services, and the percentage of students who are English Language Learners. The fifth indicator was the school's previous CSAP scores. Previous CSAP scores were included to provide a baseline marker from which to measure the current CSAP scores, the outcome variable also for the school-level analysis.

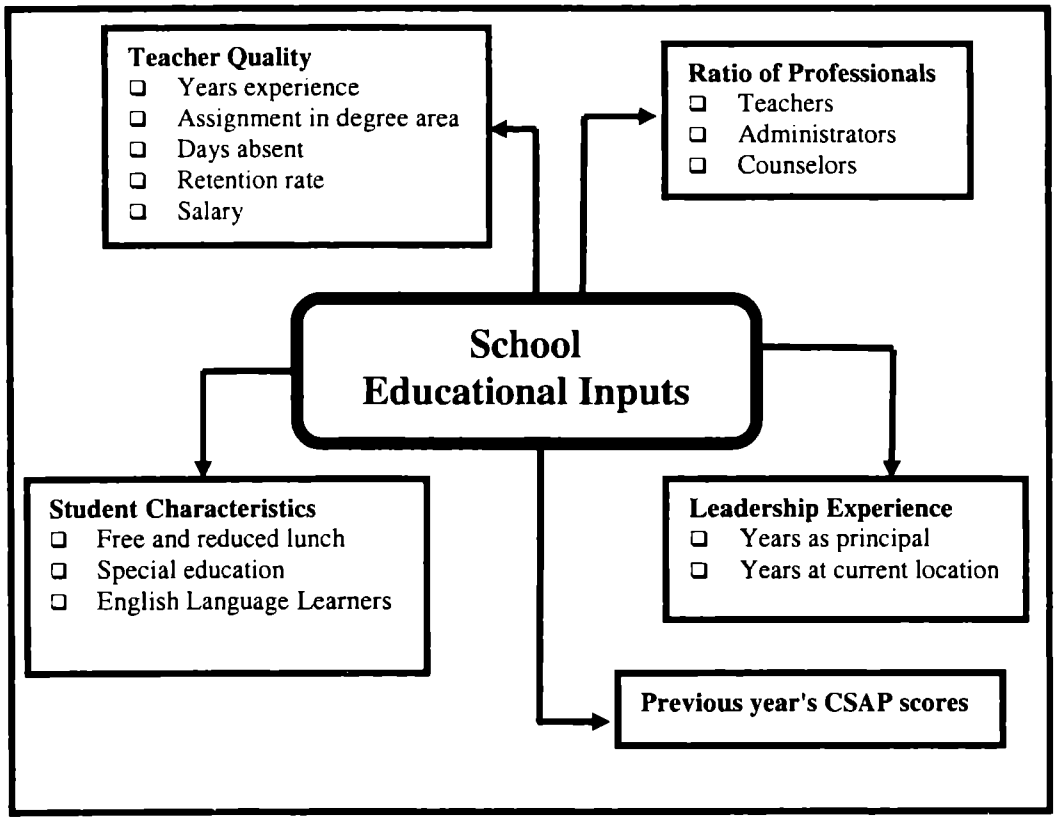

Figure 1.2. School-level educational input variables.

Study Methodology

As stated earlier, the study is made up of two distinct parts. The first portion analyzes school districts within Colorado, while the second portion analyzes individual schools within two metro-area school districts. The study was intentionally arranged using a tiered approach to allow for focus on two different social justice angles. First, in the district-level component, an examination of adequate federal, state, and local inputs for districts was included. On the other

hand, in the school-level section, adequate division of resources within the control of the school district was the concentrated focus.

Two types of analyses were used for both district-level and school-level investigations. The first was an exploratory factor analysis (EFA) and the second was a multiple regression. Using EFA allowed for the identification of variables that were, in essence, overlapping. By reducing overlapping variables, the opportunity for multicollinearity to interfere with the findings was diminished, and the number of variables in the regression equation was lessened. Using regression analysis allowed for the creation of a model to determine the APM for each school district and for schools within two school districts.

Study Limitations

While much thought was put into designing a tiered inquiry into adequate educational inputs in Colorado school districts and schools, limitations to the study exist. For one, all secondary data was used for the district-level portion of the study. Although the data were compiled from reputable sources, I was not involved in the collection. This limitation could also be viewed as a strength because there was less opportunity to influence, either consciously or unconsciously, the information.

A second limitation is that the analysis is strictly quantitative. As an educator, I fully realize the vital pieces of information that can not be captured

through test scores. Great insights are often revealed when using qualitative measures. But for this study, a larger-scale quantitative analysis using secondary data was designed. This study does open the door to future researchers to build upon the foundation created from these findings.

A third limitation of the study is that the school-level analysis only includes secondary schools in two school districts. The study would have been strengthened by including schools from districts throughout Colorado. Because the school-level analysis required some information gathered from the school districts themselves, I needed to submit an application to conduct external research to each district for approval. The complexity of each district's approval process kept me from branching out to include additional school districts in the school-level analysis. Again, future follow-up studies could be completed with additional school districts to widen the reliability scope of the study.

Concluding Introductory Remarks

Through this study, I intended to determine if significant differences exist in APM between districts serving more Latino American students and those serving fewer Latino American students. Findings from this study demonstrate that schools in Colorado do provide different opportunities for student achievement.

Because differences in fundamental areas such as School Environment, Teacher Quality, Leadership Experience, and Revenue are identified, lower scores

and overall performance ratings contribute to school-controllable and district-controllable factors. These findings should initiate conversations on creating adequate educational environments and opportunities for all students. In addition to sparking conversation, these significant findings should set in motion the drafting of education legislation to allow for a more adequate allocation of education quality indicators and opportunities for all schools.

CHAPTER 2

LITERATURE REVIEW

"The America that I love is one that values freedom and the differences of its people. Education is the key to understanding" (Asfahani, 1996, p. 18), and the more educated people are, the better society is (Swail, Cabrera, & Lee, 2004). This viewpoint is particularly acute given that the face of American society is changing substantially. National projections estimate that the percentage of Latino American children enrolled in K-12 schools will increase from 14% in 2000 to 25% by 2050 (Viadero, 2005). To maintain the overall strength of the United States, schools must meet the needs of all of its students, specifically the fast-growing population of Latino Americans. With a population of more than 25 million, Latino Americans are the second largest and fastest growing population in the United States (Besnette & Schoales, 2004; Hernandez & Nesman, 2004; Suro, 1999; Tatum, 2003; Weiner, Leighton, & Funkhouser, 2000).

Students in the United States generally do not have equal access to quality education (Kozol, 2000; McWhirter, McWhirter, McWhirter, & McWhirter, 1998; Tatum, 2003). America's schools fail to educate large numbers of students, and the

cause of this failure lies with schools, not with the students (Amster, 1994). Latino American students do not receive the quality of education they deserve to attain an independent, self-sufficient life in the United States, perpetuating the downward spiral of life opportunities (Denver Commission on Secondary School Reform, 2005).

In Colorado, like the rest of the states in the United States, Latino American students' high school dropout rates are particularly dismal (Blake, 2005; Colorado Children's Campaign, 2004; Hayes & Polis, 2005; Hernandez & Nesman, 2004; Téllez, 2004; Walters, 1998; Weiner et al., 2000). This becomes a national issue because "as Latinos become a majority population in many states, failure to address the dropout/graduation issue will have disastrous implications" (Montecel et al., 2004, p. 171). To stop the slide, schools must develop strategies for engaging all students and provide opportunities for academic success for Latino American students (NASSP, 2005).

An Achievement Gap

Three decades ago, the achievement gap was declining, but the progress ceased around 1988, and for the last 18 years the gap has actually expanded (Haycock, 2001). Recent studies in Denver's schools (see Tables 2.1, 2.2, 2.3, 2.4, 2.5 and 2.6) reveal that the gap not only exists but that it is continuing to widen (Horrell & Guzman, 2005). It appears that the longer a Latino American student is

Table 2.1

2002 9th Grade DPS Students' Reading Proficiency Levels Over 3 Years

Racial/Ethnic Group	2002 9th Grade Total Number	2002 9th Grade At or Above Proficiency	2003 9th Grade Total Number	2003 9th Grade At or Above Proficiency	2004 9th Grade Total Number	2004 9th Grade At or Above Proficiency
Black American	1016	37%	1181	35%	1134	40%
Latino American	2255	25%	2874	25%	2816	25%
White American	1069	75%	1167	67%	1062	71%
Total	4544	40%	5480	37%	5269	38%

Note. From *Colorado Student Assessment Program* (Denver Public Schools, 2004).

Table 2.2

2002 10th Grade DPS Students' Reading Proficiency Levels Over 3 Years

Racial/Ethnic Group	2002 10th Grade Total Number	2002 10th Grade At or Above Proficiency	2003 10th Grade Total Number	2003 10th Grade At or Above Proficiency	2004 10th Grade Total Number	2004 10th Grade At or Above Proficiency
Black American	917	34%	890	40%	891	33%
Latino American	1881	25%	1759	29%	2022	25%
White American	1031	68%	953	73%	932	70%
Total	4028	39%	3791	43%	4051	39%

Note. From *Colorado Student Assessment Program* (Denver Public Schools, 2004).

Table 2.3

2002 9th Grade DPS Students' Writing Proficiency Levels Over 3 Years

Racial/Ethnic Group	2002 9th Grade Total Number	2002 9th Grade At or Above Proficiency	2003 9th Grade Total Number	2003 9th Grade At or Above Proficiency	2004 9th Grade Total Number	2004 9th Grade At or Above Proficiency
Black American	1016	21%	1181	23%	1134	28%
Latino American	2254	13%	2877	15%	2815	15%
White American	1069	60%	1167	55%	1062	60%
Total	4543	27%	5483	26%	5268	28%

Note. From *Colorado Student Assessment Program* (Denver Public Schools, 2004).

Table 2.4

2002 10th Grade DPS Students' Writing Proficiency Levels Over 3 Years

Racial/Ethnic Group	2002 10th Grade Total Number	2002 10th Grade At or Above Proficiency	2003 10th Grade Total Number	2003 10th Grade At or Above Proficiency	2004 10th Grade Total Number	2004 10th Grade At or Above Proficiency
Black American	918	22%	890	23%	891	23%
Latino American	1882	16%	1761	15%	2022	15%
White American	1032	58%	953	63%	932	60%
Total	4031	29%	3793	30%	4051	28%

Note. From *Colorado Student Assessment Program* (Denver Public Schools, 2004).

Table 2.5

2002 9th Grade DPS Students' Math Proficiency Levels Over 3 Years

Racial/Ethnic Group	2002 9th Grade Total Number	2002 9th Grade At or Above Proficiency	2003 9th Grade Total Number	2003 9th Grade At or Above Proficiency	2004 9th Grade Total Number	2004 9th Grade At or Above Proficiency
Black American	999	4%	1179	3%	1141	5%
Latino American	2245	3%	2870	3%	2843	4%
White American	1063	34%	1170	29%	1063	37%
Total	4508	11%	5476	9%	5306	11%

Note. From *Colorado Student Assessment Program* (Denver Public Schools, 2004).

Table 2.6

2002 10th Grade DPS Students' Math Proficiency Levels Over 3 Years

Racial/Ethnic Group	2002 10th Grade Total Number	2002 10th Grade At or Above Proficiency	2003 10th Grade Total Number	2003 10th Grade At or Above Proficiency	2004 10th Grade Total Number	2004 10th Grade At or Above Proficiency
Black American	908	3%	900	4%	892	2%
Latino American	1876	3%	1768	3%	2046	2%
White American	1024	26%	964	31%	939	30%
Total	4004	10%	3820	11%	4085	10%

Note. From *Colorado Student Assessment Program* (Denver Public Schools, 2004).

in school, the greater the gap for that child becomes (Colorado Children's Campaign, 2004). As long as an achievement gap exists, a great part of our population is being underserved and inadequately educated.

Interestingly, Reid (2004) questioned teachers about the achievement gap and found that teachers were likely to attribute the cause of the gap to family or student-centered factors. Student interviews from the same study identified school-related causes to explain the achievement gap. In an earlier study, Carnevale (1999) found in the middle and high school years that low aspirations are not the problem, but rather mismatches among the student's future vision and the academic courses they take in middle school and high school. It appears that many Latino American students have a desire to attend post-secondary schools but are unaware of the classes they should take. In the findings of one study, Latino American students completing Algebra 2 cut the gap between White Americans and Latino Americans completing college in half (Honawar, 2005). Simply dispersing this information to parents, students, educators, and policy makers should encourage districts to require students complete at least Algebra 2 in high school. By adopting this policy, any student who chooses to attend college has a much better chance of completing their degree.

A Snapshot of Denver's Latino American Population

An estimated 62% of the Latino Americans who have recently moved to Denver were born outside of the United States (Colorado Children's Campaign, 2004). Because such a large percentage of Latino Americans moving to Denver have recently immigrated to the United States, many of Denver's new students were born in a different country with different cultural norms and are likely to have limited English proficiency (Colorado Children's Campaign). Family, religion, and discipline are examples of cultural norms that are central to Latino culture (Cavanagh & López, 2004). For example in the United States more than 25% of Latino Americans, compared to just 11% of White Americans, live with five or more people (Cavanagh & López). Furthermore, Latino women are often expected to begin families at an early age. In Denver, Latino Americans account for 78% of the teenage births with White Americans accounting for only 6% (Colorado Children's Campaign). Regardless of the parent's citizenship status, babies born in the United States are citizens of the United States.

Complexity of the Issue

Attempting to create educational environments that provide better opportunities for Latino American students to be successful is difficult at best, although understanding the complexity of the issue is a necessary starting point. To begin with, it is complicated to identify the target "Latino American student"

population with much variance in socioeconomic status, country of origin, length of time in the United States, English proficiency, and so forth (Hernandez & Nesman, 2004). Second, when narrowing to "Latino American students," literature suggests that if their ancestors were voluntary minorities (i.e., Cuban Americans, Filipino Americans, and so forth) instead of involuntary minorities (i.e., Mexican Americans, Puerto Ricans, Native Americans, and so forth), difference are evident in their long-term emotional feelings affecting their comfort level within the United States (Conchas, 2001; Rong & Brown, 2001). Third, the numbers of second-generation Latino American students are expected to double by 2020 (Freeman, 2004). This increase adds complexity because it is expected that the majority of these students will require English-language support even though they will have been born in the United States.

Differences Among Generations of Latino Americans

In 2000, about 40% of all United States Latino Americans were foreign-born immigrants to the United States (Chapa & Rosa, 2004). Currently, children of immigrants account for 1 in 5 students (Conchas, 2001; Orellana, 2001; Qin-Hilliard, Feinauer, & Quiroz, 2001; Sadowski, 2004; Suárez-Orozco, C., 2001; Suárez-Orozco, M., 2001) enrolled in United States schools, with the number expecting to increase to 1 in 3 by 2020 (Suárez-Orozco, C.).

In Denver high schools, hostility has been noted between different generations of Latino American students (Aguilera, 2004). The hostility has surrounded issues of Spanish fluency, "acting White," and being "Whitewashed" (Aguilera, p. A 14). Some students are accused of trying to forget their past and to adapt fully to American culture in order to fit with the majority population, while others are offended by these actions and lash out (Asfahani, 1996).

Colorado's Residents

As stated earlier, the students enrolled in Colorado schools, as of 2003, include 44,085 Black American students, 191,976 Latino American students, and 489,053 White American students (Colorado Department of Education, 2003). From the 2000 count through 2003, the Black American population increased by 2.44%, the Latino American student population increased by 5%, and the White American population decreased by 1.05% (Colorado Department of Education). Currently immigrants account for 34% of Colorado's Latino American population (Aguilera, 2004). These statistics convey that Colorado's White American student population is diminishing as both Black and Latino Americans are growing.

Denver's total population is 2,581,506 and the Latino American population is 476,627, which is 18.5% of the total state population (Chapa & Rosa, 2004). Denver's population grew over 21% from 1990-2003 with Latino Americans accounting for 79% of the city's growth (Colorado Children's Campaign, 2004).

Currently, 32% of Denver's residents are Latino American, but almost 50% of the students enrolled in Denver schools are Latino American (Colorado Children's Campaign; Denver Commission on Secondary School Reform, 2005). Latino Americans comprise approximately about 33% of Denver's total population, account for 50% of the total population under the age of 18, and encompass almost 67% of the children living in poverty (Colorado Children's Campaign).

Donning a Cap and Gown

Nationwide, Latino American students are more likely to drop out of school than any other group of student (Paige, 2003). Furthermore, approximately 30% of students drop out of school each year in the United States, and the number increases sharply to approximately 50% in urban locations (Olson, 2005a). While the rest of the nation's high school graduation rates have increased, Latino American students' dropout rates remain more than double that of Black Americans and over triple that of their White American peers (Walters, 1998). Only approximately half of Mexican Americans over the age of 25 have completed high school (Conchas, 2001; Tatum, 2003).

The average Latino American high school graduate finishes with having taken lower levels of Math courses than any other group of students (Swail et al., 2004). Nationally, only 4% of Latino American 12th graders test at a proficient level in Math (Paige, 2003). Glimmers of success have been revealed in studies

showing that 60% of Latino American high schools students completing an advanced Math course go to a four-year college or university compared to only 16% of students advancing only as far as intermediate level Math (Paige).

To further compound this issue, the number of Latino American students graduating from high school and being prepared for post-secondary educational opportunities is low (Paige, 2003). Of the Latino American students graduating from high school, only 29% have completed the necessary coursework to attend college (Hayes & Polis, 2005). In another study of 1,000 Latino Americans high school graduates, only 277 qualified for college based on the courses that they had completed in high school (Swail et al., 2004). These numbers demonstrate that even though these students are graduating, they are clearly not in a position to choose to attend post-secondary education. Clearly, greater effort needs to be placed on enrolling students in appropriate and challenging courses.

Colorado's Graduation Data

More than 25% of Colorado students are Latino American, but less than 15% of Colorado high school graduates are Latino American students (Sanchez, 2004). Like the national rates, Latino American student graduation rates are significantly lower than those of White American students, with Colorado falling 7% short of the national average (Blake, 2005; Rouse & Sherry, 2004). Colorado's Latino American high school students have less than 50% likelihood of graduating from high school (Besnette & Schoales, 2004). Denver's dropout rate is the third

worst in the country (Hayes & Polis, 2005) as evidenced by only 42% of Latino American students graduating, in comparison to 68% of their White American peers in 2003 (Colorado Children's Campaign, 2005; Hayes & Polis).

Despite the high dropout rates, most Latino American students want to be successful in school (Sadowski, 2005). According to a 40,000-student survey conducted by Ronald Ferguson of Harvard University's John F. Kennedy School of Government, Latino American students were *more* likely than their White American peers to believe it is "very important" to "study hard and get good grades" (Sadowski, p. 4). Latino American students believe in the importance of education, yet they may harbor negative attitudes toward education because of their actual school experiences (Schwartz, 1989; Smith, 2000).

According to *Denver's Latino Students* (Colorado Children's Campaign, 2004), fewer than half of Denver's Latino American adults have a high school diploma and less than one out of ten have a college degree. Not surprisingly, Latino American students struggle more in school than other students (Sanchez, 2004). Some of the major obstacles in the lives of Latino American students include working part-time or full-time jobs, not seeing a long-term reason for attending school, and not understanding the benefit of college (Stern, 2004). In addition, Latino American students might encounter teachers who offer little support and counselors who are busy or otherwise unavailable (Stern).

Gender has been noticed as another obstacle in educational achievement. Latino American females, for instance, often will defer to boys in mixed gender settings when expected to perform an academic task (Delpit, 1995). Once in the company of all females, they will then be more likely to display their knowledge (Delpit, 1995b). To complicate matters, quite often Latino American families encourage their sons to attend college while discouraging their daughters because of traditional family roles and dynamics (Walters, 1998).

Parent Involvement

Despite common misperceptions, most Latino American parents have high expectations for their children to do well in school and to attend college (Stern, 2004; Walters, 1998). In spite of their high expectations, many parents lack the knowledge, information, or both to help their children reach these academic goals (Stern). Rong and Brown (2001) found that many immigrant parents recognize that if their children are educated and socialized into mainstream society through schools, their children's chance to be successful increases drastically.

Immigrant parents value education but may not be involved in schools as educators traditionally expect parents to be involved (Suárez-Orozco, C., 2001). Many immigrant parents are uncomfortable with their English skills and choose not to be involved to avoid discomfort or embarrassment (Wiltz, 2004). Second, many other cultures greatly respect teachers and feel uncomfortable asking questions for fear it could be interpreted as disrespectful (Suárez-Orozco, C., 2001; Wiltz).

Third, many parents are confused about the school's expectations for their children and do not understand how to support their child in American schools (Wiltz) Finally, many students may not have the resources required to complete homework assignments because they lack computers, Internet access, sufficient English skills, and understanding of the concepts being taught (Suárez-Orozco, C.).

School Culture

Schools must promote opportunities for student-adult relationships (Cavanagh & López, 2004; Sadowski, 2005; Suárez-Orozco, C., 2001; Weir Jr., 1996). As Sadowski observes, "regardless of the level of encouragement students receive at home, positive relationships with adults at school—teachers, counselors, administrators, coaches—can also make a crucial difference" (p. 2). When seeking to increase student retention, a close relationship with a teacher is an essential ingredient (Nieto, 1999). Literature repeatedly shows the important link between supportive adult relationships and student academic success (Nieto, 1999; Sadowski). Districts and schools that keep their student to teacher, administrator, and other professional ratios low send a clear message about the value of building stronger relationships between adults and students.

Students require a safe, respectful, and caring environment to perform up to their potential (Denver Commission on Secondary School Reform, 2005). Knowing an adult in the school cares about a student can be the difference needed

for that child to continue attending school (Gates, 2005; Montecel et al., 2004; Weiner et al., 2000). Teachers must seek a careful balance between creating these friendly relationships while continuing to demand rigorous academic effort (Gordon, 2004b; Makkonen, 2004; Olson, 2005b; Sadowski, 2005).

Generational Immigration Patterns

The needs and goals of students, teachers, and schools vary based on their environment and how long their family has been in the United States. Because differences exist among generations of Latino Americans, it is not possible to group all Latino Americans into one category. For instance, when looking at Latino American youth, I could divide students living in Colorado into three broad categories associated with their assimilation process: (a) native to Colorado, (b) multi-generational in Colorado, and (c) recently immigrated to Colorado. Whereas it is obvious that not all of Colorado's Latino American youth have identical schooling experiences, students in similar environments are more likely to have parallel goals. For example, students native to Colorado are more likely to choose to stay in their community. If they choose to attend college, they will most likely attend a school in their immediate community (Chang & Szelenyi, 2002; Cohen, 1990; Laden, 2001; Santos, M., 2004)

Second, multi-generational Latino Americans might view education as a lower priority if their family has made a living without attaining higher levels of

education. In fact, multi-generational Latino Americans tend to exhibit higher dropout rates and lower achievement rates than other groups (Walters, 1998). John Ogbu (1992) found that some minority students renounce education after repeatedly noticing that it does not offer them the same rewards it does for the majority population. For example, the United States 1990 census data shows that the mean annual income for White American male high school graduates was $22,521 while for Latino Americans it was only $14,644 (Walters).

Third, families who have recently immigrated are most likely to aspire to higher educational attainment but are also less likely to understand the required elements for college acceptance. Completing college applications and financial aid forms can be confusing for a highly education, proficient English speaker. These tasks can become downright intimidating for individuals lacking a strong grasp of the English language and American culture (Greene & Greene, 2004). Often times, the miscommunication of expectations and necessary requirements, not low motivation levels, are the basic problems of recently immigrated students being admitted to college (Carnevale, 1999).

Past studies have shown that Latino American student achievement decreases with each successive generation (Conchas, 2001). When immigrant students first arrive, they generally spend more time on homework and tend to do well in school (Suárez-Orozco, M. M., 2001). Typically, newly immigrated students perform at higher levels than United States born Latino Americans. But

trends show that as these immigrated students become more Americanized, they are likely to become less committed to school (Rong & Brown, 2001; Suárez-Orozco, M., 2001; Walters, 1998).

A Leader with Laser-Like Focus

Districts and buildings with high administrator retention are able to maintain a laser-like focus on the organization's vision, goals, and most importantly, student achievement (Denver Commission on Secondary School Reform, 2005; Northouse, 2004). The building principal is the most important element in creating a high-achieving school (Horrell & Guzman, 2005). Concisely stated, "good schools have good principals" (Jesse, Davis, & Pokorny, 2004, p. 25). The school leader sets the culture, tone, and vision of the school (Horrell & Guzman; National Association of Secondary School Principals, 2005). Productive leaders are easily accessible, share their thinking and rationale for decisions with all involved individuals, and build trust through their predictability (Gordon, 2004a).

In addition, effective leaders assume responsibility for the performance of teachers and students and are willing to take action, when necessary, if teachers are unproductive, uncaring, or both. Such teachers will be harmful to their students and can poison the entire school atmosphere if no action is taken to terminate their damage (Fullan, Bertani & Quinn, 2004; Horrell & Guzman, 2005). When leaders allow teachers to remain in positions where they are unsuccessful or poorly

matched, it can actually decrease the motivation and accomplishments of the successful teachers in the building (Collins, 2001).

Teacher Quality

Teachers in high-poverty, high-minority schools are often less experienced and are more likely to be un- or under-qualified (Diamond & Tamman, 2004; Flannery & Jehlen, 2005; Makkonen, 2003; Nieto, 1999; Reyes, 2003; Sadowski, 2004; Shields, Humphrey, Wechsler, Riel, Tiffany-Morales, Woodworth et al., 2001). Although some dedicated, qualified, and impassioned teachers choose to teach in high-poverty and high-minority schools, capable teachers are less likely to teach in areas with poor conditions, where performance standards will be less likely to be reached (Darling-Hammond; Suárez-Orozco, C., 2001; Suárez-Orozco, M., 2001).

Years of Experience

Most research studies show that teachers become increasingly effective during their first five years of teaching (Bracey, 2004). Because teacher quality strongly influences student achievement, Barth (1990) boldly claimed that, "probably nothing within a school has more impact on students in terms of skill development, self-confidence, or classroom behavior than the personal and professional growth of the teacher" (p. 49).

Teachers, who know what they are teaching and how to teach best the material, are critical to effective learning (Denver Commission on Secondary School Reform, 2005; Spellings, 2005; Steinberg, 1998a). Teachers become more effective at delivering curriculum in ways that will be relevant and meaningful to their students when they have experience teaching the same content for a few years (Diamond & Tamman, 2004). A research study in the Boston Public School system examined the affect teachers can make on student achievement. After just one academic school year, the students of highly effective teachers demonstrated six times the learning growth as students of other teachers (Haycock, 2001).

Because nothing is more important in the learning process than a good teacher, low-achieving students most need the highest quality teachers (Denver Commission on Secondary School Reform, 2005; Spellings, 2005). Many contributing factors to the achievement gap are beyond a school's grasp, but teacher quality remains within the educational systems' control (Diamond & Tamman, 2004; Spellings; Steinberg, 1998a).

Absences

Much attention has been placed on the need for high quality teachers in each and every classroom in the United States. But, if those teachers are often absent, the classrooms then become staffed with usually much less qualified substitute teachers (Bowers, 2001; Patterson, Collins, & Abbott, 2004; Scott,

1998). High levels of teacher absences can hurt both student achievement and student attendance (Sherry, 2006). Typically teachers are reported absent even when they are participating in professional development activities, which is different than the way most other professions calculate employee attendance rates (Sherry). Interestingly, when compared to other professions, teachers have lower absenteeism rates (Scott). Nevertheless, schools with teachers who have lower absenteeism rates may be providing higher quality instruction (Patterson, et al.).

Salary

Working conditions, salaries, and support need to be fairly distributed among all schools for all schools to have an equal chance in recruiting and retaining good teachers (Archer, 2005; Bainbridge, 2003; Bhatt, 2005; Spellings, 2005). Bainbridge (2003) articulates that, "if the education system ever is to be better balanced for all children, we must first fix the issue of teacher recruitment by providing all school systems with the tools and incentives necessary to attract the best candidates" (p. A 08).

In addition to the working conditions and daunting performance expectations, teaching salary discrepancies add to the segregation of quality teachers in more affluent areas. For example, Kozol (2000) discovered that salaries of beginning teachers in urban districts started at $27,000, whereas beginning teachers in suburban districts started at $42,000. This trend continued with the

median salary in urban districts at $43,000 compared to $71,000 in suburban districts (Kozol).

Degree in Area

As earlier stated, students in high need areas have the greatest need for qualified and dynamic teachers, yet typically these students are assigned teachers with the weakest academic and educational foundations (Haycock, 2001; Makkonen, 2003; Nieto, 1999). Some states reduce the certification requirements for teachers in order to hire teachers who do not meet certification requirements and place them in low-income urban schools that are often harder to staff (Reyes, 2003). This practice encourages and further promotes inequitable education in schools serving students of color (Reyes). One of the basic premises of No Child Left Behind is to have a highly qualified teacher in every classroom. Although this policy has been in place for a number of years, many schools serving lower socioeconomic communities continue to have problems attracting enough highly qualified candidates. The policy has created a mandate for the problem without creating a solution for the problem.

Revenue Expenditures

Education policy needs to be passed allowing for uniform funding of all schools (Banks et al., 2001; Olson, 2005b). Current "funding systems and tax policies leave most urban districts with fewer resources than their suburban

neighbors, but schools with high concentrations of low-income and 'minority' students receive fewer resources than other schools within these districts" (Darling-Hammond, 2004, p. 1056). One aspect of my study measures the funding practices in Colorado to determine if inequitable practices exist in Colorado as well.

Instructional Dollars

Some believe that with all of the obstacles facing teachers in high-poverty schools, the resources and salaries should be higher than those allotted to affluent schools (Archer, 2005). However, in reality, based upon common distribution of resources, high-poverty and high-minority schools receive far less than wealthier schools, even within the same district (Archer; Darling-Hammond, 2004). High-poverty, high-minority schools are more likely to employ less experienced teachers (Archer; Darling-Hammond, 2003; Paterson et al., 2004; Shields et al., 2001), and less experienced teachers are generally paid less than veteran teachers.

While districts pay less to teachers in schools with less experienced teachers, they do not level this inequality by allocating additional resources to these less experienced teachers in often higher-need environments (Archer, 2005). Recently, some districts have begun exploring the idea of calculating teacher salary as part of the entire school budget. As a result, schools employing less expensive teachers would have more money to increase resources in other areas (Archer; Denver Commission on Secondary School Reform, 2005).

Non-Instructional Dollars

Revenue inequities contribute to great differences in learning environments based upon the location of a school. Schools serving White Americans and affluent students often receive more money and tend to have more conducive learning environments (Bainbridge, 2003; Conchas, 2001; Darling-Hammond, 2004; Makkonen, 2003). Working and learning conditions are often better in schools where more money is available to spend on construction and building maintenance (Bainbridge, 2003). Further, "research indicates that low-income minority students often encounter aesthetically unpleasant and ill-equipped learning environments, inadequate instructional materials, [and] ineffective teachers" (Conchas, p. 476). Inadequate educational environments are likely to affect Black and Latino American students more than any other group of students because United States schools have become re-segregated (Darling-Hammond). In fact,

> more than two-thirds of 'minority' students attend predominantly minority schools, and one third of Black and Latino students attend intensely segregated schools . . . most of which are in central cities . . . . currently, about two-thirds of all students in central city schools are Black or Hispanic (Darling-Hammond, p. 1055)

Revenue Sources

In addition to the achievement gap, a great funding gap exists within schools serving White American students and schools serving Black and Latino American students as well as those serving affluent students and those serving poor

students (Darling-Hammond, 2004; Makkonen, 2003). School funding and resource allocation policies typically leave poor and minority students with more students per classroom, outdated books and technology, less qualified teachers, and limited access to high quality curriculum (Darling-Hammond).

Per Pupil Revenue

Makkonen (2003) found that in most states across the country, school districts with a larger percentage of minority students received much less money per student than districts serving the fewest Black and Latino American students. To rectify such disparity, educational policy needs to provide uniform funding of all schools (Banks et al., 2001; Olson, 2005b). Currently, schools are typically funded in ways that ensure more resources for schools located in suburban neighborhoods than those located in urban neighborhoods (Archer, 2005; Darling-Hammond, 2004; Makkonen). Similar patterns are often found within districts. For example, even within the same school district, schools serving higher numbers of minority and low-income students may receive fewer resources than schools serving more affluent students (Archer; Darling-Hammond).

Kozol determined that "in 1997-1998, NYC [New York City] spent about $8,200 per pupil, including special education, and an actual sum of $5,200 per pupil in a mainstream elementary classroom. In the same year, Great Neck spent about $18,000 and Manhasset nearly $20,000" per pupil (2000, p. 359). These

figures show that some schools receive more than three times the funding to educate students, where schools in less affluent neighborhoods receive much smaller amounts. Inequitable practices like these leave poor and minority students with lower quality textbooks, fewer resources, limited technology, and generally less materials in addition to larger classes being taught by less qualified and inexperienced teachers (Archer, 2005; Darling-Hammond, 2004).

Calculating Funding Allowance

Colorado uses a formula to calculate Total Program, which is the funding allowance per school district. The formula uses "pupil count" multiplied by "total per-pupil funding" plus "at-risk funding" plus "on-line funding" to determine Total Program. Next, I will explain what each of these terms means and how it affects school district funding.

Pupil Count

School funding is based on a schools' student enrollment as of the first day in October, the official student count day in Colorado (Chapman & Kispert, 2005). For the 2005-2006 school year, the base funding amount is $4,717.62. Typically, the allocated funding is determined on the student enrollment for the current year. In the event of fluctuating enrollment numbers, funding is based on the average of the last three student count days and the student count from the current year. Student enrollment numbers in Colorado school districts range from 52 students in

Campo RE-6 to 86,339 in Jefferson County (Colorado Department of Education, 2005).

Total Per-Pupil Funding

In addition to the base allocation determined by student enrollment, additional money, called "total per-pupil funding," is distributed through a formula calculating variation in district (a) cost of living averages, (b) personnel costs, and (c) size (Chapman & Kispert, 2005). In the past, instead of cost of living, funding was adjusted for inflation. Beginning in 2004-2005, cost of living is factored by looking at the cost of living compared with the household income in the district. This change allows for resource allocation to reflect local economic changes. The cost of living factor is indexed, currently ranging from 1.009 to 1.641 based on local economic trends (Chapman & Kispert).

The second factor of "total per-pupil funding," personnel costs, represents the largest expense in every school district. Obviously, personnel costs correlate with student enrollment numbers. The funding for this factor is determined through past information and also by using the cost of living factor. For 2005-2006, the projection ranges from 79.96% to 90.50% (Chapman & Kispert, 2005).

The final factor of "total per-pupil funding" incorporates district size. Including district size is necessary because larger school districts often have greater purchasing power when purchasing services. With this in mind, the size factor gives more funding to smaller districts, fewer than 4,023 students, than to larger

districts, more than 4,023 students (Chapman & Kispert, 2005). The size-factor projections are expected to range from 1.0297 to 2.3725 in the 2005-2006 budget year (Chapman & Kispert).

At-Risk Funding

The third part of the Total Program formula is "at-risk funding." "At-risk funding" is determined by the federal free and reduced lunch program population. For each student identified as at-risk, the district receives funding of between 12% and 30% of its "Total Per-Pupil Funding" (Chapman & Kispert, 2005). Beginning in the current fiscal year, the at-risk definition is being expanded to include "students whose CSAP scores are not included in calculating a school's performance grade because the student's dominant language is not English and who are also not eligible for free lunch" (Chapman & Kispert, p. 4).

On-Line Funding

The final element of the Total Program formula is "on-line funding." This aspect of the formula allocates funding for students enrolled in a school district's on-line program at the minimum funding level of $5,689 (Chapman & Kispert, 2005). If the student was enrolled in the on-line program during the 2001-2002 fiscal year, then the student is funded at the same level as other students in the district.

Together, these components comprise the Total Program funding process for Colorado. In the 2005-2006 budget year, each school district is guaranteed

Total Program funding of at least $5,689 per student (Chapman & Kispert, 2005). Each year, school districts Total Program per pupil funding cannot exceed 125% of the prior year's funding allocation (Chapman & Kispert).

Colorado's Funding System

For the most part, districts are able to determine how to spend the money allocated from the Total Program, as long as they comply with three state-required stipulations. The first stipulation states that each district must set aside a minimum of $167 per pupil for supplies and materials (Chapman & Kispert, 2005). Second, districts need to hold back between $271 and $800 per pupil for capital reserves. Districts with more than $1,355 per pupil already in reserves can opt out of this second condition (Chapman & Kispert). The final requirement is that at least 75% of the at-risk funding be used for its at-risk students or to develop the staff working with these students (Chapman & Kispert).

Local Share

Colorado has determined that funding for school districts Total Program is first provided through local means. District local share comes from two sources, property taxes and specific ownership taxes. If the funding provided from the local sources is insufficient, the state subsidizes the financial deficiency.

Property Taxes

Colorado school funding system requires each district to enforce a property tax levy. The revenue collected from the taxes varies greatly among districts because of the wide range of property values throughout the state. At this point, Colorado does not transfer any money collected from property taxes in one district to other districts, but instead allows the money collected to stay in the district. Statewide, property taxes are expected to provide an average of $2,084 per student, which accounts for about 33.8% of the Total Program funding needed (Chapman & Kispert, 2005).

Specific Ownership

Specific ownership taxes are collected through vehicle registration monies. The county collects the money and then splits the proceeds with school districts. The specific ownership amount is determined by the total monies collected in the previous year. Specific ownership taxes are expected to give $235 per student, accounting for approximately 3.8% of the Total Program funding needed (Chapman & Kispert, 2005).

State Share

In Colorado, the state will subsidize each school district whose Local Share is not able to fund fully its Total Program amount. The State Share monies are provided mainly from state income, sales, and collected tax revenues. For the

2005-2006 budget year, the State Share to districts will range from $520 to $10,115 per student, with an average projection amount being $3,845 per student, or 62.4% of Total Program funding (Chapman & Kispert, 2005).

Other Funding

Districts may receive funding from sources other than their Local and State Share. For example, districts may ask voters to raise "override" property taxes through an additional mill levy. A mill tax means one-tenth of one percentage, or .001. Chapman and Kispert (2005) offer the example that a home valued at $100,000 would have an assessed value of $7,960 and each mill tax would raise an additional $7.96 (p. 6). In addition, school districts with capital needs, building needs, or both have five other avenues to receive funding for these needs. These five areas are (a) use their capital reserve fund, (b) hold an election to authorize issuing bonds, (c) hold an election to authorize a three-year mill levy for building construction and security, instructional, and information technology, (d) apply for funding through a competitive grant process for capital construction and school renovation, or (e) if identified as a "growth district," apply for a loan through the State Treasurer. In addition, Colorado State Board of Education is authorized to provide emergency supplemental funds to school districts in great need.

Concluding Remarks

At this point, anyone would be hard-pressed to produce examples of Colorado districts and schools with evidence of Latino American students' sustained exemplary academic performance. Districts or schools with low percentages of Latino American students have been able to mask the poor results easier than those serving greater percentages of Latino American students. Through this study, as detailed in Chapter 3, a measure has been developed that allows educators to determine if student achievement results produced at both district and school levels are expected, based upon district and school inputs.

CHAPTER 3

METHODOLOGY

For the study, my group of interest is school-aged Latino American children. School districts, and then individual schools, are the units of analysis. In examining the educational process, the study emphasizes outputs and adequacy, using CSAP scores as the outcome measure. Although experts and practioners differ on the CSAP measurement accuracy, this was selected as the outcome variable because it is the current gauge of student, school, and district performance in Colorado.

This study design creates a model to determine adjusted performance measures (APM) for school districts and secondary schools within two large school districts in Colorado (Stiefel et al., 2005). Because I intend to share my findings with policy makers and educational practioners, I have chosen to design a quantitative and mainly secondary data analysis. Policy makers need reliable information in a timely manner; for that reason, a secondary data analysis of information collected from trusted and reputable archive sources is appropriate (Young & Ryu, 2000).

Valuable lessons have been learned from previous studies using secondary data. Because studies using secondary data are more economical in both time and money than primary data analyses, secondary data analyses are popular in social science research (Kiecolt & Nathan, 1985; Stiefel et al., 2005). For example, secondary analyses can allow for large-scale studies to be completed within a reasonable time frame (King, Fitzhugh, Bassett, McLaughlin, Strath, Swartz, et al., 2001; Ramisetty-Mikler, Caetano, Goebert, & Nishimura, 2004). A secondary analysis is a viable research method when the original data are available and the data provide the information needed to answer a new research question (Church, 2002).

Data Collection

Before data was collected, the population of interest for the study needed to be determined. It was decided that a logical starting point would be to measure school districts throughout the state by comparing APM. Second, APM would be compared within two school districts in Colorado: Exploration Public Schools (EPS) and Mountain View Public Schools (MVPS). To maintain anonymity, the names of districts and schools included in the school-level portion of the study have been changed. These two districts are valid selections because they are large districts and serve economically and ethnically diverse student populations. Charter schools were excluded from the study's second aspect because they have

different financing regulations and management designs and tend to be fairly autonomous from school districts (Bowman, 2000).

Before comparing the districts, they were organized by setting. The settings, as determined by Colorado Department of Education (n.d.), were broken into five categories: (a) Denver metro, (b) urban-suburban, (c) outlying city, (d) outlying town, and (e) rural. Categorizing the school districts by setting is important because a district's location often affects many of the variables included in the study. For instance, districts in a rural setting require more money per pupil in order to offer a range of courses that would be competitive with the courses offered in urban and suburban schools. Furthermore, rural school districts are given additional liberties for teachers instructing outside of their primary certification areas. Because of the difficulties associated with having a small teaching staff yet needing to offer a wide range of courses, rural educators sometimes are required to teach courses beyond their primary certified discipline.

District-Level Analysis

As previewed in Chapter 1, school districts were measured through seven educational input categories (see Figure 3.1). The inputs ranged from less direct, such as revenue, to more direct, such as the School Environment and Professional Assignment. These areas included (a) School Environment, (b) District Revenue Sources, (c) Revenue Expenditures, (d) Teacher Quality, (e) Ratio of Students to

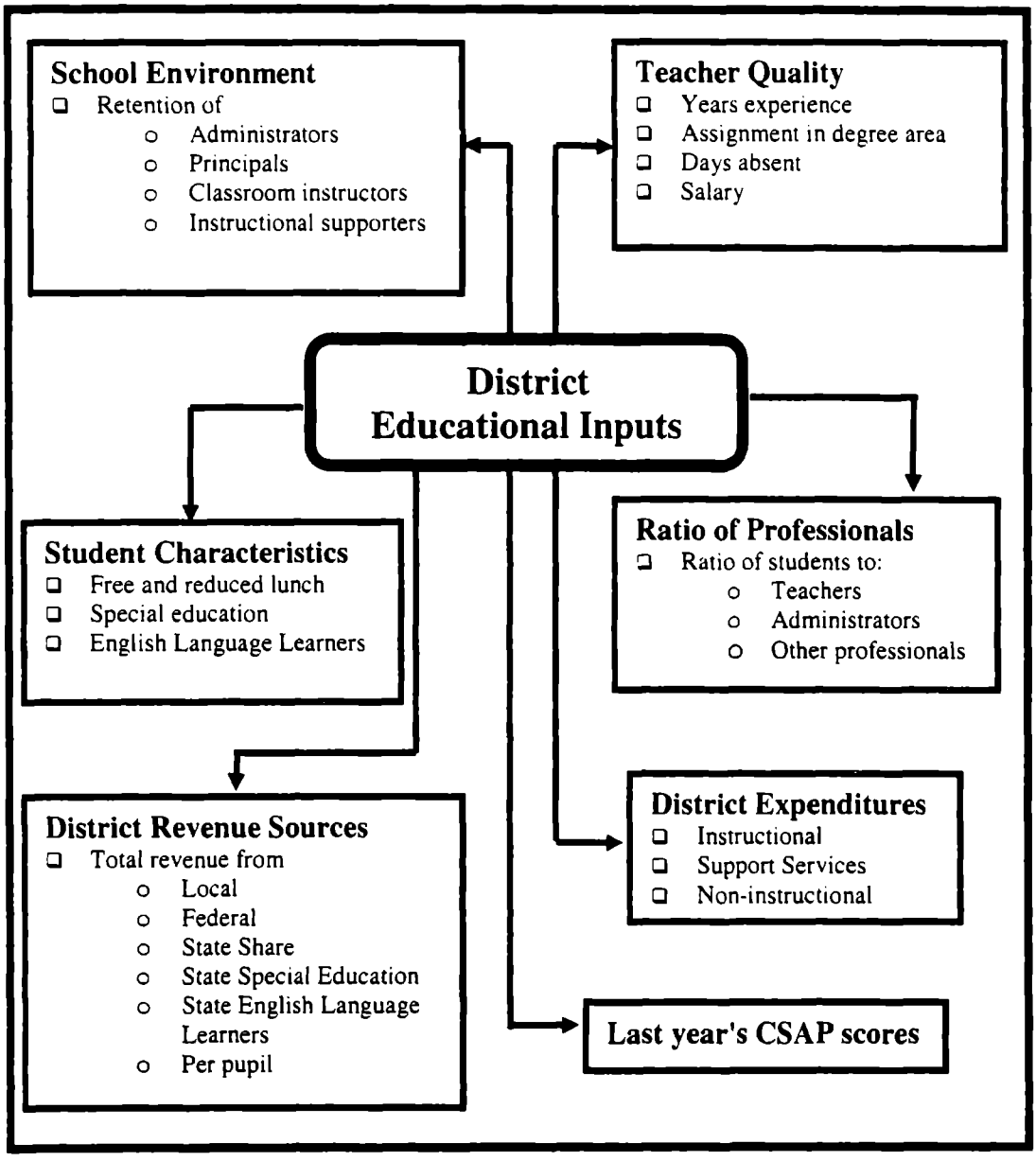

Figure 3.1. District-level educational input variables.

professionals, (f) Student Characteristics, and (g) Previous Year's Test Results.

School Environment

The school's environment and culture is difficult to measure without designing a specific study centering on the school's culture. Because this is simply one component of the study, the choice was made to explore this variable through data reflecting the percentage of adults choosing to work in the building or district.

Many studies focus on the importance of retaining teachers and counselors whom students know and trust (Denver Commission on Secondary School Reform, 2005; Ennis & McCauley, 2002; Kannapel, Clements, Taylor, & Hibpshman, 2005). The case can be logically made that districts and schools with high retention rates of their employees are more positive school environments. The School Environment is measured through the average percentage of administrators, principals, classroom instructors, and instructional supporters retained from the last two school years.

District Revenue Sources

Issues of money have surrounded school districts for years. Does money make a difference in educating students? No clear answer to this question is universally accepted as the response seems to change based on who is answering the question. In this study, the choice was made to include variables for district revenues and the allocation of monies. For District Revenues, the percentage of total revenue from local sources, state share, state Special Education funding, state

English Language Learner funding, state Gifted and Talented funding, federal revenue, and per pupil revenue were compared.

Revenue Expenditures

In addition to the District Revenue Sources, the percentage of total revenue allocated to instructional, support services, and non-instructional costs were compared. The instructional costs include salaries, employee benefits, purchased services, supplies and materials, and capital outlay. Support services money pays for pupil support, instructional staff support, general administration, school administration, operations and maintenance, pupil transportation, food services, and other support costs. The non-instructional costs include services to the community such as recreation, child care programs, and other expenditures. In addition, the change in Revenue Expenditures was calculated from the 2003-2004 and 2004-2005 school years. When calculating the change, the higher the percent increase shows an increase in money allocated for 2004-2005 from the previous school year.

Teacher Quality

Many researchers have demonstrated that high quality teachers can make a great difference for the students they teach (Diamond & Tamman, 2004; Flannery & Jehlen, 2005; Haycock, 2001; Ladson-Billings, 1994). The more debatable issue is how to determine a quality teacher using quantitative methods. For the purpose of this study, four indicators were used to determine the Teacher Quality variable. The four indicators include the average Years of Teaching Experience, Percentage

of Teachers Instructing in Their Degree Area, average Percentage of Days Teachers are Absent, and the average Teacher Salary. Whereas the average Teacher Salary is not necessarily tied to quality, it is tied to Years of Teaching Experience and also to the level of education teachers have earned.

Ratio of Students to Professionals

One area where most educational experts and school reform models agree is the importance of students developing relationships with adults in their school (Cavanagh & López, 2004; Denver Commission on Secondary School Reform, 2005; Sadowski, 2005; Suárez-Orozco, C., 2001; Weir Jr., 1996). Because this is one variable of many in my study, a way to measure the potential for relationships by determining the ratio of professionals in the building to students was created. The rationale for this measure is that smaller ratios may lend themselves to establishing stronger relationships between adults and students. For Ratio of Students to Professionals, the number of teachers, administrators, and other professionals (counselors, social workers, and librarians) were compared to the number of students in the school district. School districts with smaller ratios of students to professionals may be providing greater opportunity for professional-student relationships to develop. In addition, the change in student to professional ratios was calculated between the 2003-2004 and 2004-2005 school years. A reduction in ratios can promote an environment for developing relationships between the adults and students in the building.

Student Characteristics

Student Characteristics are necessary in analyzing the study results through a social justice lens. One of the main intentions of this study is to compare educational adequacy for districts serving larger Latino American student populations. For Student Characteristics, the percentages for student ethnicity, students qualifying for free and reduced lunch, students qualifying for special education, and English Language Learners were included.

CSAP Scores

As mentioned earlier, CSAP scores are one common way progress is measured for students, schools, and districts. Although many people may question whether the CSAP offers a completely accurate picture of learning, it is the current gauge used to measure learning in Colorado.

The study includes two years of Reading and Math CSAP scores. Furthermore, CSAP scores were included for all students and Latino American students in Reading and Math. Reading and Math scores were selected because both can predict current and future academic success. Reading skills should be necessary to succeed in any academic setting. Advanced Math capability has been linked to college enrollment (Bracey, 2004; Honawar, 2005; Makkonen, 2003; Paige, 2003).

School-Level Analysis

Next, information was collected on each school in EPS and MVPS. Educational quality indicators were compared for the district schools through five areas (see Figure 3.2). The areas include (a) Teacher Quality, (b) Ratio of Students to Professionals, (c) Leadership Experience, (d) Student Characteristics, and (e) Previous Year's CSAP Scores.

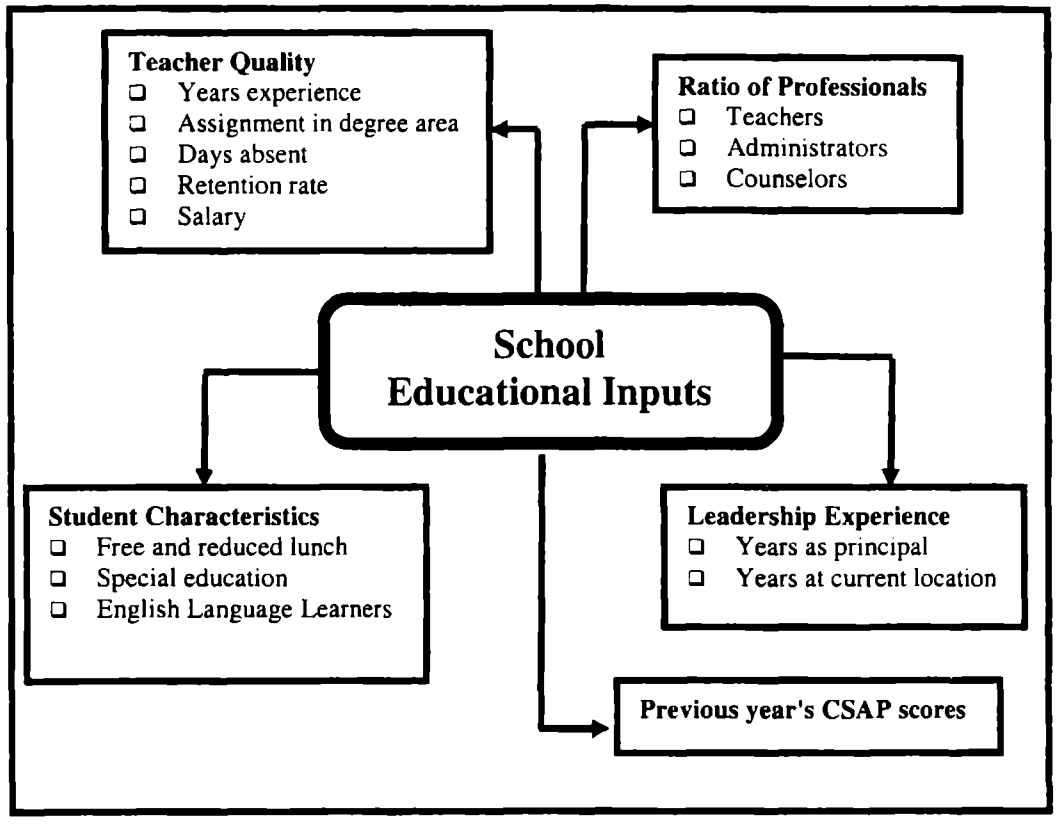

Figure 3.2. School-level educational input variables.

Teacher Quality

As mentioned above, creating a large-scale quantitative measure for Teacher Quality is a difficult task. For the school-level analysis, comparisons were made for the average number of years teaching, the Percentage of Teachers Instructing in Their Degree Area, the average percentage of days absent, the retention rate of teachers for the last two years, and average Teacher Salary. Within a school district, Teacher Salary is determined by teaching experience and education level. Because teaching experience is included separately, this measure was included in an attempt to compare teacher degree levels within the school.

Ratio of Students to Professionals

As in the district-level analysis, comparing the number of professionals to students is one way to explore the likelihood of developing strong relationships between students and adults. Also, when ratios are very large, the case load becomes too great for professionals to make much progress with any of their students. For the ratio of students to professionals, the number of students in relation to teachers, administrators, and counselors were compared.

Leadership Experience

Like most professions, leaders typically have their own vision for the organization, a personal leadership style, and beliefs about best practices. Schools

are no different. Each time a school gains a new leader, progress is halted while the new leader determines the direction the school needs to move for greatest success. For the most part, the longer a leader has been at a school the more momentum the school has gained in moving towards the leader's vision (Collins, 2001). In addition, when educators make the decision to move from their previous position into a leadership role, time needs to be factored in for new leaders to learn the basics of their new positions. For Leadership Experience, the number of years each principal has been a principal and the number of years the principal has been at the current location were compared.

Student Characteristics

Student Characteristics are used in the school-level analysis much as they are used in the district-level analysis. The Student Characteristics are necessary to determine the number of school-level inputs to produce adequate outcomes. Student Characteristics at the school level also compared student the percentage of students qualifying for free and reduced lunch, the percentage of students qualifying for special education, and the percentage of English Language Learners.

CSAP Scores

CSAP scores were also used as the outcome variable for the school-level analysis. As in the district-level analysis, two years of CSAP scores were included and selected Reading and Math scores because both can predict current and future

academic success. Reading skills should be necessary to be successful in any academic setting whereas advanced Math capability has been linked to college enrollment (Bracey, 2004; Honawar, 2005; Makkonen, 2003; Paige, 2003).

District Membership Differences

Finally, the decision was made to determine if differences existed in the educational experience based on student enrollment in either EPS or MVPS. A dummy variable for district location was used to determine if differences existed simply because of district membership.

Data Sources

Secondary data was used for the portion of the study comparing school districts. Because the data collected for the study were from mainly secondary public sources and did not identify individual students or teachers, the University's Human Subjects Review application was accepted with exemption status. The process became much more difficult for the school district Human Subject Review to collect data on individual schools. In the next two sections, the process used to collect the data elements for the study is explained in detail.

District-Level Data Sources

All of the district-level data was available from reports through the Colorado Department of Education's (CDE) Web site. In the following sections,

the step-by-step processes are explained for gathering the data for this study, with the intention of allowing future researchers the opportunity to replicate the study. In addition, I may choose to repeat this study in a number of years to track changes in Colorado schools.

School Environment

School Environment was measured through administrator, principal, classroom teacher, and instructional support turnover rates in each school district. For this information, the report was titled "Personnel Turnover Rate by District and Position Categories" and was accessible from the CDE Web site. This report was available from the CDE homepage by clicking on *School/District Statistics*, then clicking on *School/District Staff Statistics*, next clicking on *Fall 2005 Staff Data* and finally clicking on *Fall 2004 Staff Data*. Under each of these final pages was the link to the report for the respective year. The administrator, principal, teacher, and instructional support turnover percentages for 2003-2004 and 2004-2005 school years were used. Then, the 2003-2004 turnover percentages were subtracted from the 2004-2005 turnover percentages to arrive at the 2003-2004 to 2004-2005 change percentages for the study. Based upon the rationale for this indicator explained earlier, the lower the turnover rate means the more positive the school environment. For the 2003-2004 to 2004-2005 turnover change, a negative number shows turnover has decreased, meaning retention has increased.

District Revenue Sources

Information was collected on each district's revenue sources from reports on the CDE Web site. For this information, the report titled "Comparison of Revenues and Other Sources" was used and was accessible from the CDE Web site. This report can be located from the CDE homepage by clicking on *School Finance*, next clicking on *District Revenues and Expenditures*, then clicking on *Fiscal Year 2004-2005 Revenues and Expenditures*, and finally clicking on *Comparison of Revenues and Other Sources*. This report identifies the district revenue from a number of potential sources. For this study, the total local revenue, the state share, the state Special Education funding, the state English Language Learning funding, the state Gifted and Talented funding, and the total federal revenue were used.

Revenue Expenditures

Information on each district's Revenue Expenditures was collected from a report on the CDE Web site titled "Comparison of All Program Expenditures (All Funds)." To locate this report from the CDE homepage, click on *School Finance*, next click on *District Revenues and Expenditures*, then click on *Fiscal Year 2004-2005 Revenues and Expenditures*, and finally click on *Comparison of All Program Expenditures (All Funds).*

This report identifies each school district's expenditures by categories, including instruction, support services, community services, other, and total. The

instructional category includes salaries, employee benefits, purchased services, supplies and materials, capital outlay, and other expenditures (Herrmann, Stroup, & Moloney, 2006). The support services category includes pupil activities, instructional staff activities, general administration, school administration, operations and maintenance, transportation, food services, and other support (Herrmann et al., 2006). The Community Service category includes dollars paid for providing services to the community. Finally, Other Expenditures includes expenditures aside from those listed above.

For this study, expenditures were compared by the percentage spent for instructional, support services, and non-instructional purposes. The non-instructional dollar category was created by combining community service and other expenditures. Then, the instructional amount was divided by the total expenditures to determine the percent spent on instructional activities. This process was repeated to determine the percent spent on support services and non-instructional activities.

Teacher Quality

Teacher Quality was measured in four ways: (a) years of experience, (b) percent of teachers instructing in the area of their degree, (c) percent of days teachers are absent, and (d) the average teacher's salary. Each of these four areas was accessible from a School Accountability Report (SAR) and so a SAR was used from one of the schools within each school district.

Ratio of Students to Professionals

For determining the ratio of students to professionals, information from a SAR was used. For the ratio of students to teachers the number of teachers employed by the district from the SAR under "district full-time and part-time teachers" was collected. Full-time teachers were counted as one and part-time teachers as one-half, meaning every two part-time teachers were recorded as one full-time teacher. Then the school district student enrollment was divided by the total number of district teachers. The same process was followed for determining the student to administrator ratio and the student to professional ratio.

Student Characteristics

The Student Characteristic indicators consist of the percentage of students qualifying for free and reduced lunch, the percentage of students qualifying for Special Education, and the percentage of English Language Learners. All of the information needed was available through reports accessible from the CDE Web site.

These reports can be located from the CDE Web site by clicking on *School/District Statistics*, then clicking on *2005 Pupil Membership*. From here, clicking on the report titled "Fall 2005 Pupil Membership by County, District, Ethnicity, Gender, and Grade Level." The groups were combined into the following classifications: (a) White Americans, (b) Latino Americans, (c) Black Americans, and (d) Other Americans. Finally, each group was divided by the total

enrollment to determine each ethnic group's percentage within the district's student population.

For the free and reduced lunch portion, the report titled "K-12 Free and Reduced Lunch Eligibility by County and District" was used. This report was available from the CDE Web site by clicking on *School/District Statistics*, then clicking on *2005 Pupil Membership*, and finally clicking on the above report. For this study, the information labeled "% Free and Reduced" was used for each school district.

Finally, for Special Education participants and English Language Learners, the report titled "Pupil Membership by Instructional Program" was used. This report can be located from the CDE Web site. First click on *School/District Statistics*, then click on *2005 Pupil Membership*, and then click on the report named above. The numbers reported for both Special Education and English Language Learner counts were used. Finally, each count was divided by the total district population for the percentage of Special Education and English Language Learners in the school district.

CSAP Scores

The district-level CSAP scores were used from the CDE Web site. This report is available by first clicking on *Assessment*, then clicking on *Visit the CDE Unit of Student Assessment Web site* link, next clicking on *CSAP*, and then under the *Data and Results* category clicking on *CSAP District and School*

Disaggregated Data and clicking on *CSAP Summary Data*. From this point, the reports titled "Reading Grades 3-10," "Math Grades 3-10," "CSAP School and District Summary Results, Reading Grades 3-10," and "CSAP School and District Summary Results, Math Grades 3-10" were used. Then the grading categories were collapsed into three groups: (a) advanced and proficient, (b) partially proficient and unsatisfactory, and (c) no score. Finally, the number from each group was divided by the total number of students in the district to determine the percent of students achieving in each testing group.

School-Level Data Sources

The data for the school-level analysis was mostly gathered through published SAR, with a few items gathered from school-level employees in EPS and district-level employees in MVPS. Because it was not possible to locate all of the information through publicly accessible means, the assistance of both school districts was requested in collecting the remaining data points.

For both districts, the outside researcher protocol was followed. MVPS accepted the research proposal and offered support by gathering reports with the information requested for the study. EPS did not accept the research proposal on the grounds that they did not have the budget to provide personnel to locate the information requested. Because I was unable to use district-generated reports, other avenues to locate the needed data were required. In the sections to follow, the

methods followed in gathering the data are outlined, including the alternative avenues used to collect information.

Teacher Quality

The Teacher Quality indicator was made up of five variables including: (a) years of experience, (b) percent of teachers instructing in the subject they received their degree, (c) teacher absenteeism percent, (d) teacher retention rate, and (e) Teacher Salary. The data for all five variables was found on the SAR. For the variables years of experience, percent instructing in degree area, percent of days absent, and salary, the data was simply recorded from the SAR. For retention rate, the number of teachers who left the school last year was taken from the SAR and subtracted this number from the total number of teachers at the school. Once again, each part-time teacher was counted as one-half of a full-time teacher. Then, the number of retained teachers was divided by the total teachers for the retention percentage. This same process was followed using data from both the 2003-2004 and 2004-2005 school years and then averaged the two years for an average retention rate.

Ratio of Students to Professionals

For determining the school-level ratio of students to professionals, information from SAR was used. For the ratio of students to teachers the number of teachers employed by the district was collected from the SAR under "your

school full-time and part-time teachers." As mentioned earlier, full-time teachers were counted as one and part-time teachers were counted as one-half. Then, the school student enrollment was divided by the total number of teachers. The same process was followed for determining student to administrator ratios and counselor to student ratios.

Leadership Experience

Because Leadership Experience is reported on each school's SAR, both pieces of data were collected from the SAR. The information "number of years as principal at any school" and "as principal at this school" was used. The numbers are reported in the same format used for the study.

Student Characteristics

The school-level Student Characteristic indicators consist of free and reduced lunch percentages, Special Education participant percentages, and the number of English Language Learners. The ethnicity of students and free and reduced lunch percentages were available from reports accessible through the CDE Web site. This report is available from the CDE Web site by click on *School/District Statistics*, then clicking on *2005 Pupil Membership.* From here, clicking on the report titled "Fall 2005 Pupil Membership by School, Ethnicity, Gender & Grade Level." Again like the district-level portion, groups were combined into the following classifications: (a) White American, (b) Latino

American, (c) Black American, and (d) Other American. Finally, each group was divided by the total enrollment to determine each ethnic group's percentage within the school student population.

For the free and reduced lunch portion, the report titled "K-12 Free and Reduced Lunch Eligibility by County, District, and School" was used. This report can be located from the CDE Web site by clicking on *School/District Statistics*, then clicking on *2005 Pupil Membership*, and finally clicking on the above report. For this study, the information labeled "% Free and Reduced" was used for each school district.

Although Special Education student population numbers are available at the district level, they are not freely available for the school level. Because I had the support of MVPS, the numbers reported from their district office were used. On the other hand, the Special Education numbers for each school in EPS was collected by a school-level employee. Although these numbers were gathered with the best of intentions, they were not "cleaned up" by the district-level employees.

Similar to Special Education enrollment numbers, English Language Learner enrollment data is available at the district level but not broken out at the school level. Again, like the data collection for the Special Education numbers, the numbers provided from the district office were used for MVPS. For EPS, the English Language Learner data was located from the district's Web site by

accessing each school profile where it listed the percentage of English Language Learners enrolled in each school.

CSAP Scores

The school-level CSAP scores were found from the CDE Web site. This report can be located by clicking on *Assessment*, then clicking on *Visit the CDE Unit of Student Assessment Web site* link, next clicking on *CSAP*, and then under the *Data and Results* category click on both *CSAP Summary Data* and *CSAP District and School Disaggregated Data*. From these points, the reports titled "Reading Grades 3-10," "Math Grades 3-10," "CSAP School and District Summary Results, Reading Grades 3-10," and "CSAP School and District Summary Results, Math Grades 3-10" were used. Like the district-level data, the grading categories were collapsed into three groups: (a) advanced and proficient, (b) partially proficient and unsatisfactory, and (c) no score. Finally, the number from each group was divided by the total number of students in the district to determine the percent of students achieving in each testing group.

Data Analysis

Once all of the data were collected, the data was entered into the Statistical Package for the Social Sciences (SPSS) for analysis. SPSS (2005) is a computer program that allows the user to collect, analyze, and manage data. SPSS is a trusted research tool that has been used in the field of education for over 37 years.

Two types of analyses were used. The first was a principal components analysis (PCA) and the second was a multiple regression. Using PCA allowed for "mathematically derive a relatively small number of variables to use to convey as much of the information in the observed/measured variables as possible" (Leech, Barrett, & Morgan, 2005, p. 76). Second, a regression analyses was calculated. The purpose of using a multiple regression is to predict a dependent variable from several independent variables (Leech et al.).

Units of Analysis

Two types of analyses were used, each with different units of analysis. The first unit was the school district in which inputs and outputs were analyzed across Colorado districts to determine the adjusted performance measure. The second analysis used schools as the unit of analysis. In the second analysis, schools within EPS and MVPS were compared to one another.

Principal Components Analysis

PCA's have fewer conditions and assumptions than other types of analysis. For one, in order to produce valid results, it is necessary that the variables must relate (Leech et al., 2005). Second, large sample sizes increase the accuracy of the resulting factors (Leech et al.).

To begin, a PCA was calculated on the variables within a few of the categories. In other words, PCA reduce the problem of multicollinearity and allow

fewer variables to be used in the multiple regressions while still providing the same information from the original, larger set of variables. For the district analysis, a PCA was administered on factors beyond district control (Student Characteristics and District Revenue Sources), the Ratio of Students to Professionals, School Environment, and Teacher Quality categories. For the school analysis, PCA were used for the Ratio of Students to Professionals and the Teacher Quality categories.

Multiple Regression

When using multiple regression, the first assumption to meet is a linear relationship between each predictor variable and the dependent variable (Leech et al., 2005). After plotting variables in a scatterplot, a relatively straight cluster was needed to meet this assumption (Leech et al.). Second, error needs to be normally distributed and uncorrelated with the independent variables (Leech et al.). The third and potentially most important assumption is multicollinearity (Leech et al.). Multicollinearity happens when two independent variables correlate too much; in essence both contain similar information (Leech et al.). Analyzing a correlation matrix assists in determining if variables are overly correlated (Leech et al.).

First, the regression was calculated using data for all students in the school district. Then, the data was rerun, this time solely using the Latino American student population characteristics and test scores. Because I did not know which variables would create the best prediction equation, I used simultaneous regression.

Analyzing the data in these ways provided multiple avenues to help answer my research questions. Using an adjusted performance measure, are school district's Latino American students' CSAP scores at predicted levels, based upon the districts' inputs? The district inputs include (a) School Environment, (b) District Revenue Sources, (c) District Expenditures, (d) Teacher Quality, (e) Ratio of Students to Professionals, (f) Student Characteristics, and (g) Previous Year's Test Results. Second, using an adjusted performance measure, are school's Latino American students' CSAP scores at predicted levels, based upon school inputs? The schools' inputs include (a) Teacher Quality, (b) Ratio of Students to Professionals, (c) Leadership Experience, (d) Student Characteristics, and (e) Previous Year's CSAP Scores.

CHAPTER 4

DISTRICT-LEVEL FINDINGS

The reauthorization of the No Child Left Behind Act of 2001 has increased attention to student achievement. Because of the growing interest in student achievement, learning gaps, and so forth, the need for school accountability is essential. Determining appropriate and accurate measures of both achieving and failing school is a pressing issue with school accountability. Although it is necessary to determine achieving and failing schools, it is simply not appropriate to look at raw test scores as numerous research studies have demonstrated the high correlation between some characteristics that are out of the control of school districts and test scores. A measure controlling for factors beyond districts' control, while holding districts accountable for factors within their control, is necessary for accurate accountability ratings.

Adjusted Performance Measures

For this study, I decided to use adjusted performance measures (APM). APM is a gauge which allows researchers to "adjust the output measure (usually a test score) for student and school characteristics beyond the control of an individual

school" (Stiefel et al., p. 17, 2005). This study has two distinct parts. This chapter addresses the first part of the study which adjusts student and school characteristics beyond the control (see Figure 4.1) of an individual school district. Chapter 5 addresses the second part of the study, adjusting those characteristics beyond the control of individual schools.

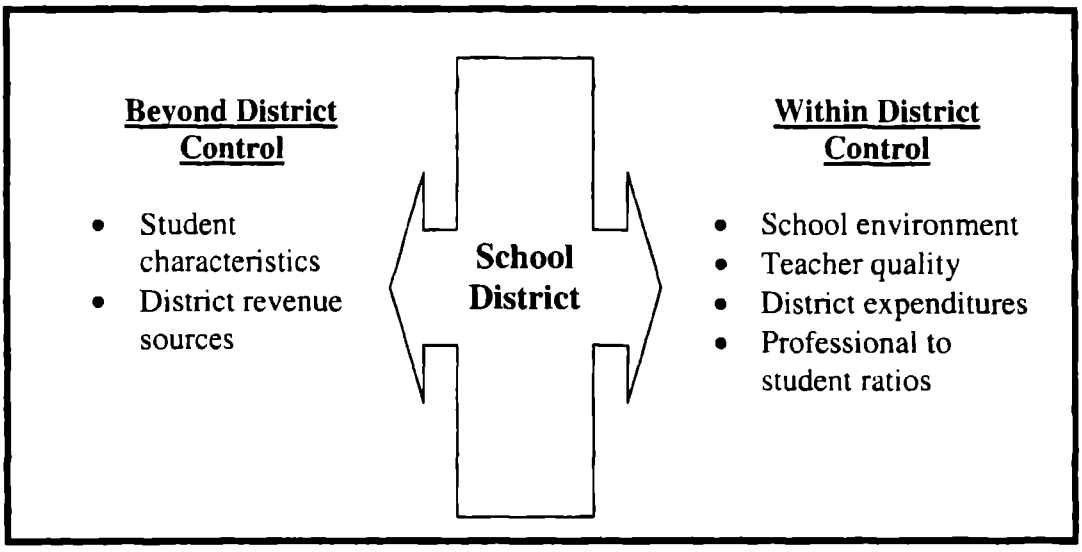

Figure 4.1. Factors affecting school districts.

The APM for this study are developed using regression equations where Math and Reading CSAP scores are the dependent variables. The independent variables consist of an assortment of student and district characteristics beyond the control of the district. The independent variables adjust for differences in Student Characteristics, District Revenue Sources, Ratio of Students to Professionals, School Environment, Teacher Quality, and District Expenditures (see Figure 4.2).

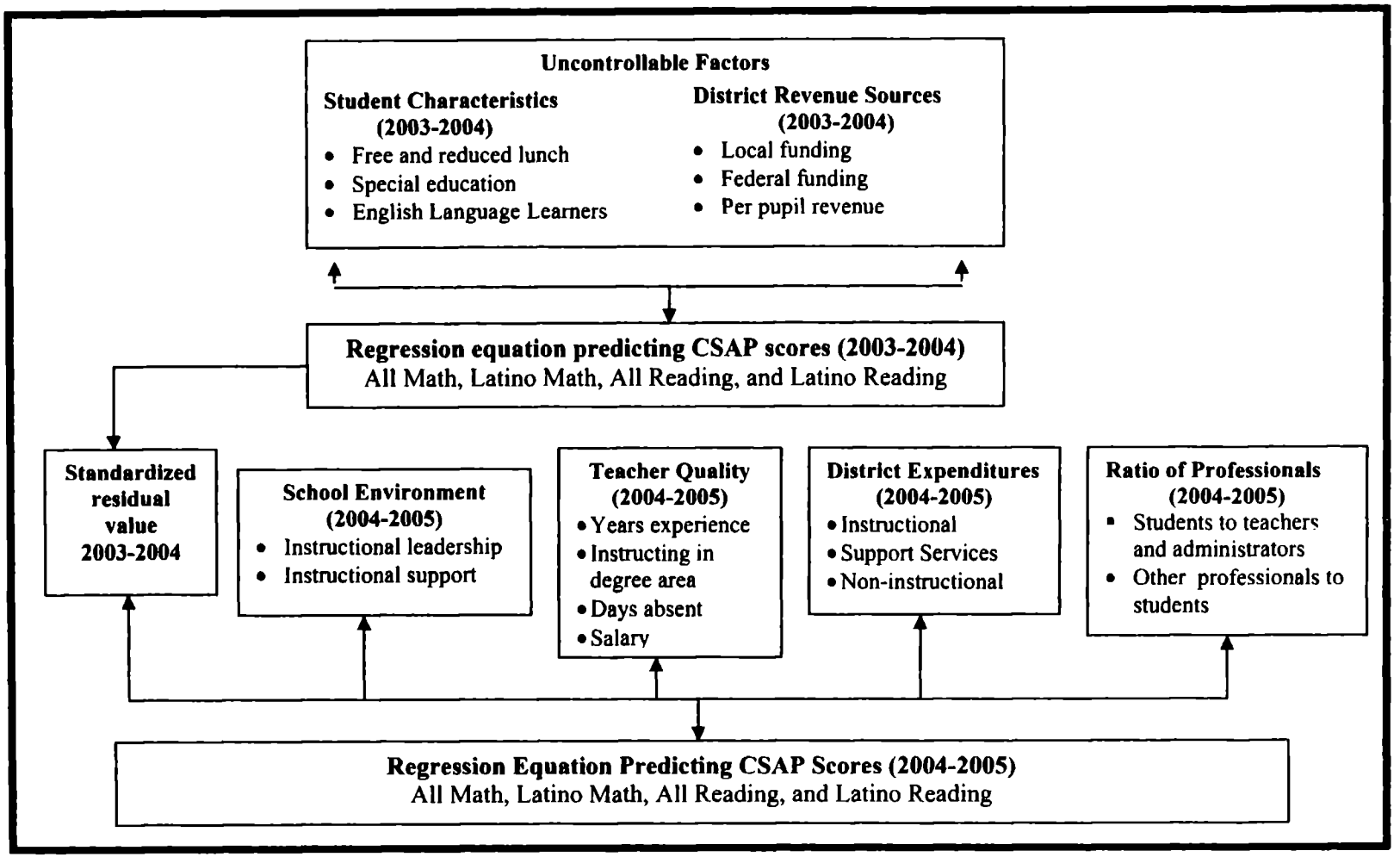

Figure 4.2. District-level Adjusted Performance Measure equation.

In addition, the Previous Year's CSAP Scores are included as independent variables to provide a measure of growth over the year. APM allow researchers to evaluate the difference between actual district CSAP scores and predicted CSAP scores from the regression equations (Steifel et al., 2005).

Principal Components Analysis

The first step of the data analysis was to perform principal component analyses (PCA) on four categories: Uncontrollable Factors (Student Characteristics and District Revenue Sources), School Environment, Teacher Quality, and Ratio of Students to Professionals. Again, a PCA was used with these four categories in an effort to reduce multicollinearity and use fewer variables while retaining the critical concepts provided by the original, larger set of variables. Although some variables were eliminated, the PCA results showed that one of the categories could not be reduced. The findings from the PCA follow in the next four sections.

Uncontrollable District Factors

The Uncontrollable District Factors include the following: (a) per pupil revenue, (b) free and reduced lunch participants, (c) special education participants, (d) English Language Learners, and (e) the percentage of revenue from federal sources. A principal components analysis, using varimax rotation, was performed because many of the independent variables are correlated and need to be independent while retaining as much of the information from the original measured

variables as possible. The PCA was administered with five variables: amount of per pupil revenue and percentages of free and reduced lunch participants, special education students, English Language Learners, and revenue from federal sources.

The assumptions for the PCA were checked and met. The determinant should be more than 0.00001 and here it was 0.103. If the determinant is less than 0.00001, then a factor analytic solution is not available because it requires dividing by zero (Leech, Barrett, & Morgan, 2005). The Kaiser-Meyer-Olkin (KMO) measure needs to be 0.50 to tell whether enough items are predicted by each factor (Leech et al.). The KMO was 0.611, which met the regulation limit. Finally, the significance level was 0.0001 which met the significance measure of falling below 0.050.

Two components were extracted from the analysis. After rotation (see Table 4.1), the first component accounted for 51.0% of the variance and the second component accounted for 22.9% of the variance, together explaining 73.9% of the variance. Table 4.2 displays the rotated component loadings with those less than 0.40 omitted for improved clarity (see Appendix A for additional information).

Based upon the findings from the Uncontrollable Factors PCA, two components were used to control for the factors beyond a school district's control. These components were named Income Compilation and ELL Compilation and were both added to the regression equation. Income Compilation (see Table 4.2) includes high loadings of Free and Reduced Lunch percentage, Special Education

percentage, and Federal Revenue. ELL Compilation (see Table 4.2) consists of a high loading of English Language Learner percentage and a negative loading of Per Pupil Revenue.

Table 4.1

Uncontrollable Factors Total Variance Explained

	Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.554	51.078	51.078	2.551	51.029	51.029
2	1.141	22.820	73.898	1.143	22.868	73.898

Table 4.2

Uncontrollable Factors Rotated Component Matrix

	Component Loading	
	1	2
Free and reduced lunch percentage	0.957	-
Special Education percentage	0.862	-
English Language Learners percentage	-	0.813
Per Pupil Revenue	-	-0.680
Revenue from Federal	0.858	-

School Environment

The School Environment variables include the retention of (a) administrators, (b) principals, (c) classroom instructors, and (d) instructional supporters. The second PCA was performed using varimax rotation. Two components were extracted from the analysis. After rotation (see Table 4.3), the first component accounted for 38.2% of the variance and the second component accounted for 25.1% of the variance, together explaining 63.3% of the variance. Table 4.4 displays the rotated component matrix with loadings less than 0.40 omitted to improve clarity (see Appendix B for additional information).

The assumptions for the PCA were checked and met. The determinant was 0.794 showing that this assumption was easily met (Leech et al., 2005). The KMO was 0.560, which meets the regulation limit (Leech et al.). Finally, the significance level was 0.0001 which met the significance measure of falling below 0.050 (Leech et al.).

The first component (see Table 4.4), which seems to indicate Instructional Leadership, loaded most strongly on building administrators and teachers, with a moderate loading on district administrators. The second component, which seems to track instructional support, loaded very strongly on instructional supporters (counselors, social workers, school psychologists, and so forth) with a negative loading on district administrators.

Table 4.3

School Environment Total Variance Explained

Component	Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.528	38.207	38.207	1.527	38.177	38.177
2	1.004	25.104	63.311	1.005	25.134	63.311

Table 4.4

School Environment Rotated Component Matrix

	Component Loading	
	1	2
District administrators	0.453	-0.577
Building administrators	0.790	-
Teachers	0.791	-
Instructional supporters	-	0.818

As a result of the findings from the PCA, the original four variables (district administrators, building administrators, teachers, and instructional supporters) were reduced to two variables (Instructional Leadership and Instructional Support). The two variables, Instructional Leadership and Instructional Support, were added to the regression equation. Using the components extracted from the PCA generated variable independence, reduced multicollinearity, and used fewer variables while retaining the critical concepts provided by the original, larger set of variables.

Teacher Quality

The Teacher Quality variables included the following: (a) average Years of Teaching Experience, (b) percentage of teachers instructing classes in their area of degree, (c) Percentage of Days Teachers are Absent from school, and (d) average Teacher Salary. Next, a PCA was administered with varimax rotation, on the four Teacher Quality variables. The assumptions for the PCA were checked and met with the determinant score of 0.969 and the KMO measure of 0.512. The analysis did not identify any underlying components, meaning that none of the variables could be reduced. Hence, each of the four Teacher Quality variables, Years of Experience, Instructing in Degree Area, Days Absent, and Salary, were entered separately into the regression equation.

Ratio of Students to Professionals

Ratio of Students to Professionals included three variables: the ratio of students to (a) teachers, (b) administrators, and (c) other professionals. The next PCA was administered, also with varimax rotation, on the three variables for professional to student ratios. On this initial PCA, teachers and administrators loaded strongly while other professionals barely loaded. The raw data for the variable Other Professionals was entered in to the regression equation because the raw data was sufficiently independent and allowed for additional simplicity in the regression equation. The final PCA was performed including teachers and administrators. Again, the assumptions were checked and met (Leech et al., 2005) with a determinant score of 0.549 and a KMO score of 0.500. Finally, the significance level was 0.0001 which met the significance measure of measuring below 0.050 (Leech et al.).

With a correlation value of 0.672 (see Table 4.5), the ratio of students to teachers and students to administrators demonstrated high correlation. One component was extracted from the PCA. After rotation (see Table 4.6), the component accounted for 83.6% of the variance. The component matrix (see Table 4.7) shows a high loading of both the ratio of students to teachers and students to administrators (see Appendix C for additional information).

Based upon the findings from this PCA, the component labeled Ratio of Students to Teachers and Administrators was used to measure the ratio of students to teachers

Table 4.5

Ratio of Professionals Correlation Matrix

	Teachers to students	Building administrators to students
Teachers to students	-	0.672
Building administrators to students	0.672	-

Table 4.6

Ratio of Professionals Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.672	83.587	83.587	1.672	83.587	83.587

Table 4.7

Ratio of Professionals Rotated Component Matrix

	Component Loading
	1
Students to teachers	0.914
Students to building administrators	0.914

and students to administrators. For clarity, the raw data were used for Ratio of Students to Other Professionals when entering the variables into the regression equation. Again the two variables, Ratio of Students to Teachers and Administrators and Ratio of Students to Other Professionals, were added to the regression equation.

Regression Equation

After conducting the PCA, the first part of the regression equation was applied. The purpose of this part of the regression analysis (see Figure 4.3) was to predict the Previous Year's CSAP Scores while adjusting for the factors beyond the school district's control. This regression equation was calculated four different times. The first part of the analysis predicted the districts' 2003-2004 Reading

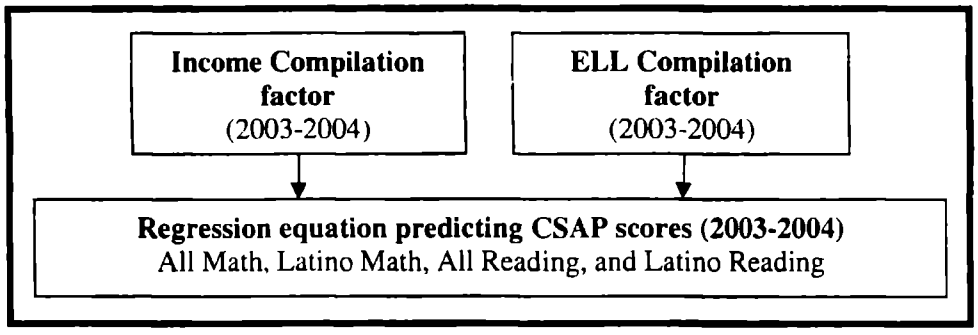

Figure 4.3. District regression equation, part one.

CSAP scores for all students. The second analysis predicted Reading CSAP scores for district's Latino American students. The third analyses predicted the district's 2003-2004 Math CSAP scores for all students, and the fourth predicted the scores of Latino American students.

Then, the standardized residuals were used from each regression to create four new variables, Reading Residual, All Students; Reading Residual, Latino American Students; Math Residual, All Students; and Math Residual, Latino American Students. These residual values, in essence, are a measure of what is not explained from the Income Compilation factor and the ELL Compilation factor. Each new variable was saved, later to be used as an independent variable in the second part of the regression equation, where 2004-2005 CSAP scores were predicted.

The purpose of the second part of regression equations (see Figure 4.4) was to predict 2004-2005 CSAP scores. By predicting the expected scores, a measure is

created to determine which districts, when considering all factors, are performing at higher levels than expected and which are performing below their expected level.

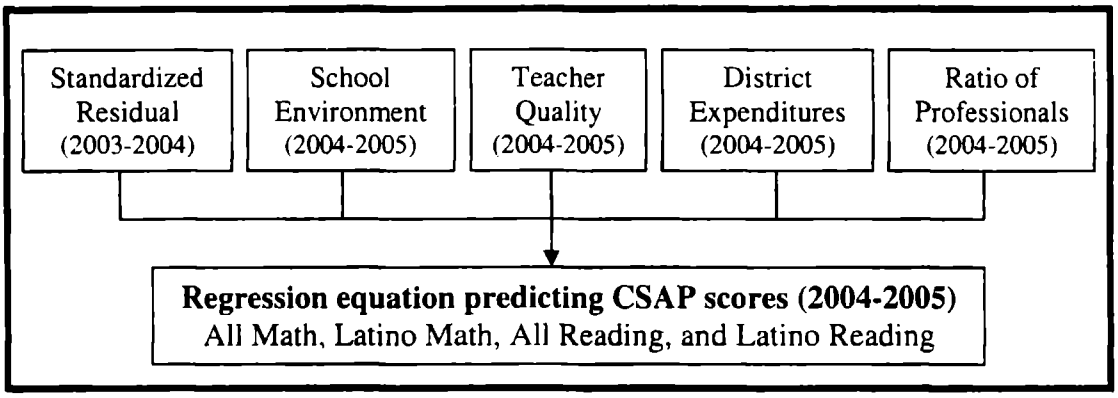

Figure 4.4. District regression equation, part two.

As in the regression equation used in part one, the part two regression equations were performed four different times. Also, the standardized residuals from each of these equations were saved as new variables. The purposes of these standardized residuals are discussed in the section titled, Interpreting the Residuals.

District Reading APM, All Students' Performance

The regression equation is broken into two parts. The first part predicts 2003-2004 Reading CSAP from the Income Compilation and the ELL Compilation. From the prediction, the standardized residual was saved and added to the second part of the regression equation. By using the residual value in the equation, the aspects that were left after predicting the 2003-2004 CSAP scores are measured.

The means, standard deviations, and intercorrelations for "Reading All, Part 1" can be found in Table 4.8. The two variables did not significantly predict 2003-2004 Reading CSAP scores, F (2, 157) = 25.32, $p < 0.0001$, meaning the residual saved for the second part of the equation contains much explanatory potential. The beta weights, presented in Table 4.9, suggest that the Income Compilation contributes most to predicting next year's test scores. The adjusted R squared value was 0.234, indicating that 23% of the variance in Reading CSAP scores was explained by the two variables measuring characteristics beyond the district's control. According to Cohen (1988), this is a small to medium effect.

The second part of the equation was calculated using multiple regression to predict the Reading CSAP scores for all students within each school district. The dependent variable was 2004-2005 Reading CSAP scores for All students, and the original independent variables included (a) the Residual Value from Part One, (b) Instructional Leadership, (c) Instructional Support, (d) Ratio of Students to Other Professionals, (e) Ratio of Students to Teachers and Administrators, (f) Years of Teaching Experience, (g) Percentage of Teachers Instructing in Their Degree Area, (h) Percentage of Days Teachers are Absent, (i) Teacher Salary, (j) Percentage of Money Spent on Instruction, and (k) Percentage of Money Spent on Support Services. The variables Percentage of Money Spent on Instruction, Ratio of Students to Teachers and Administrators, Days Teachers are Absent, Instructional Support, Years of Teaching Experience, and Teacher Salary were removed from

the equation because these variables demonstrated extreme insignificance or low beta scores.

Table 4.8

Means, Standard Deviations, and Intercorrelations for All Students CSAP Reading Scores and Predictor Variables, Part 1 (N = 160)

Variable	*M*	*SD*	1	2
Reading CSAP, All 2003-2004 Advanced and Proficient	0.644	0.159	-0.490*	-0.215*
Predictor variable				
1. Income Compilation	-0.095	0.513	-	0.318*
2. ELL Compilation	0.153	0.892		-

* $p < 0.01$.

Table 4.9

Simultaneous Multiple Regression Analysis Summary for All Students CSAP Reading Scores and Predictor Variables, Part 1 (N = 160)

Variable	*B*	*SEB*	B
Income Compilation	-0.145	0.023	-0.469*
ELL Compilation	-0.012	0.013	-0.066
Constant	0.632	0.011	

Note. $R^2 = 0.234$; F (2, 157) = 25.32, $p < 0.0001$
* $p < 0.01$.

Consequently, the regression equation demonstrating greatest strength in predicting 2004-2005 Reading CSAP scores included the following independent variables: (a) the Residual Value from Part One, (b) Instructional Leadership Turnover, (c) Ratio of Students to Other Professionals, (d) Percentage of Teachers Instructing in Their Degree Area, and (e) Percentage of Money Spent on Support Services. The means, standard deviations, and intercorrelations can be found in Table 4.10. The combination of variables moderately predicted 2004-2005 Reading CSAP scores, F (5, 149) = 29.42, $p <$ 0.0001, with two of the five variables, Part 1 Residual and Percentage of Money Spent on Support Services, significantly contributing to the prediction. The beta weights, presented in Table 4.11, suggest that previous year's residual contributes most to predicting next year's test scores, while the other factors also add to the prediction. The adjusted R squared value was 0.452, indicating that 45% of the variance in Reading CSAP scores, a medium to large effect (Cohen, 1988), was explained by the model.

District Reading APM, Latino American Students' Performance

Like the "District Reading All" equation, the "District Reading Latino American" is also broken into part 1 and part 2. The means, standard deviations, and intercorrelations for "Reading Latino American, Part 1" can be found in Table 4.12. The two variables did not significantly predict 2003-2004 Latino American Reading CSAP scores, F (2, 80) = 3.357, $p < 0.05$, meaning the residual saved for

Appendix M

School-Level Intercorrelations, Math All (N = 80)

Variable	1	2	3	4	5	6
Math CSAP, All	0.545**	0.446**	0.377**	0.373**	-0.082	0.215*
Predictor variable						
1. Part 1 Residual	-	0.068	-0.225*	-0.099	0.126	0.159
2. Teacher Experience		-	0.319**	0.299**	-0.091	0.177
3. Teacher Degree Area			-	0.283**	-0.022	0.014
4. Student to Instructional Staff Ratio				-	-0.067	0.112
5. Leader Total Years of Experience					-	0.304**
6. Leader Total Years at School						-

Note. $R^2 = 68\%$, * $p < 0.05$; ** $p < 0.01$.

Table 4.11

Simultaneous Multiple Regression Analysis Summary for All Students CSAP Reading Scores and Predictor Variables, Part 2 (N = 155)

Variable	*B*	*SEB*	B
Part 1 Residual	0.112	0.011	0.627*
Ratio Students to Other Professionals	0.000	0.000	0.082
Teaching in Area of Degree Percentage	0.094	0.058	0.102
Support Services Dollar Percentage	-0.278	0.089	-0.188*
Instruction Leadership Turnover Percentage	-0.008	0.008	-0.067
Constant	0.655	0.053	

Note. $R^2 = 0.452$; $F(5, 149) = 26.42$, $p < 0.0001$
* $p < 0.01$.

the second part of the equation contains much explanatory potential. The beta weights, presented in Table 4.13, suggest the ELL Compilation contributes most to predicting next year's test scores, while the other factor also improves the prediction. The adjusted *R* squared value was 0.054, indicating that only 5% of the variance in Latino American Reading CSAP scores was explained by the two variables measuring characteristics beyond the district's control. Five percent of the variance is a very small effect (Cohen, 1988).

Table 4.12

Means, Standard Deviations, and Intercorrelations for Latino American Students CSAP Reading Scores and Predictor Variables, Part 1 (N = 83)

Variable	*M*	*SD*	1	2
Reading CSAP, Latino American 2003-2004 Advanced and Proficient	0.403	0.156	-0.183*	-0.269**
Predictor variable				
1. Income Compilation	-0.027	0.592	-	0.438**
2. ELL Compilation	0.682	0.809		-

* $p < 0.05$; ** $p < 0.01$.

Table 4.13

Simultaneous Multiple Regression Analysis Summary for Latino American Students CSAP Reading Scores and Predictor Variables, Part 1 (N = 83)

Variable	*B*	*SEB*	B
Income Compilation	-0.021	0.031	-0.080
ELL Compilation	-0.045	0.023	-0.233*
Constant	0.433	0.023	

Note. $R^2 = 0.054$; $F(2, 80) = 3.36$, $p < 0.05$
* $p < 0.05$.

The second part of the equation was completed using multiple regression to predict the Reading CSAP scores for Latino American students within each school district. The dependent variable was 2004-2005 Reading CSAP scores for All students, and the original independent variables included: (a) the Residual Value from Part One, (b) Instructional Leadership, (c) Instructional Support, (d) Ratio of Students to Other Professionals, (e) Ratio of Students to Teachers and Administrators, (f) Years of Teaching Experience, (g) Percentage of Teachers Instructing in Their Degree Area, (h) Percentage of Days Teachers are Absent, (i) Teacher Salary, (j) Percentage of Money Spent on Instruction, and (k) Percentage of Money Spent on Support Services. The variables Percentage of Money Spent on Instruction, Teacher Salary, Years of Teaching Experience, Teachers Instructing in their Degree Area, Ratio of Students to Other Professionals, Instructional Support, and Percentage of Money Spent on Support were removed because the variables demonstrated extreme insignificance or low beta scores.

As a result, the regression equation demonstrating greatest strength in predicting Latino American Reading 2004-2005 CSAP scores included the following independent variables: (a) the Residual Value from Part One, (b) Instructional Leadership Turnover, (c) Percentage of Days Teachers are Absent, and (d) Ratio of Students to Teachers and Administrators. The means, standard deviations, and intercorrelations can be found in Table 4.14. The combination of variables predicted 2004-2005 Reading CSAP scores, F (4, 75) = 24.24,

Table 4.14

Means, Standard Deviations, and Intercorrelations for Latino American Students CSAP Reading Scores and Predictor Variables, Part 2 (N = 80)

Variable	*M*	*SD*	1	2	3	4
Reading CSAP, Latino American	0.415	0.150	0.729*	-0.154	0.117	0.277*
Predictor variable						
1. Part 1 Residual	0.085	0.901	-	-0.096	-0.031	0.350*
2. Instructional Leadership Turnover Percentage	-0.073	0.630		-	0.027	-0.030
3. Teacher Days Absent Percentage	0.057	0.018			-	-0.288*
4. Ratio Students to Teachers and Administrators	0.622	0.763				-

*$p < 0.01$.

$p < 0.0001$, with two of the four variables, Part 1 Residual and Percentage of Days Teachers are Absent, significantly contributing to the prediction. The beta weights, presented in Table 4.15, suggest that the previous year's residual contributes most to predicting next year's test scores, while the other factors also add to the prediction. The adjusted R squared value was 0.541, indicating that 54% of the variance in Latino American Reading CSAP scores was explained by the model. According to Cohen (1988), this is a large effect.

District Math APM, All Students' Performance

The means, standard deviations, and intercorrelations for "Math All, Part 1" can be found in Table 4.16. The two variables did not significantly predict 2003-2004 Math CSAP scores, $F(2, 153) = 23.43$, $p < 0.0001$, meaning the residual saved for the second part of the equation contains much explanatory potential. The beta weights, presented in Table 4.17, suggest that the Income Compilation adds most to predicting next year's test scores, while the ELL Compilation also contributes to the prediction. The adjusted R squared value was 0.224, indicating that 22% of the variance in Reading CSAP scores, a small to medium effect (Cohen, 1988), was explained by the two variables that measured characteristics beyond the district's control.

The second part of the equation was calculated using multiple regression to predict the Math CSAP scores for All students within each school district. The

Table 4.15

Simultaneous Multiple Regression Analysis Summary for Latino American Students CSAP Reading Scores and Predictor Variables, Part 2 (N = 80)

Variable	*B*	*SEB*	B
Part 1 Residual	0.116	0.014	0.699**
Instructional Leadership Turnover Percentage	-0.021	0.018	-0.089
Teacher Days Absent Percentage	1.353	0.663	0.163*
Ratio Students to Teachers and Administrators	0.015	0.017	0.076
Constant	0.318	0.043	

Note. $R^2 = 0.541$; $F\ (4, 75) = 24.243$, $p < 0.0001$
* $p < 0.05$; ** $p < 0.01$.

dependent variable was 2004-2005 Math CSAP scores for All students, and the original independent variables included: (a) the Residual Value from Part One, (b) Instructional Leadership, (c) Instructional Support, (d) Ratio of Students to Other Professionals, (e) Ratio of Students to Teachers and Administrators, (f) Years of Teaching Experience, (g) Percentage of Teachers Instructing in Their Degree Area, (h) Percentage of Days Teachers are Absent, (i) Teacher Salary, (j) Percentage of Money Spent on Instruction, and (k) Percentage of Money Spent on Support Services. The variables Percentage of Money Spent on Instruction, Days Teachers

Table 4.16

Means, Standard Deviations, and Intercorrelations for All Students CSAP Math Scores and Predictor Variables, Part 1 (N = 156)

Variable	*M*	*SD*	1	2
Math CSAP, All 2003-2004 Advanced and Proficient	0.388	0.129	-0.474*	-0.251*
Predictor variable				
1. Income Compilation	-0.098	0.516	-	0.328*
2. ELL Compilation	0.175	0.896		-

* $p < 0.01$.

Table 4.17

Simultaneous Multiple Regression Analysis Summary for All Students CSAP Math Scores and Predictor Variables, Part 1 (N = 156)

Variable	*B*	*SEB*	B
Income Compilation	-0.110	0.019	-0.438*
ELL Compilation	-0.015	0.011	-0.107
Constant	0.380	0.010	

Note. $R^2 = 0.224$; $F(2, 153) = 23.43$, $p < 0.0001$
* $p < 0.01$.

are Absent, Instructional Support, Years of Teaching Experience, Ratio of Students to Other Professionals, and Teacher Salary were removed because the variables demonstrated extreme insignificance or low beta scores.

For these reasons, the regression equation demonstrating greatest strength in predicting 2004-2005 Math CSAP scores included the following independent variables: (a) the Residual Value from Part One, (b) Instructional Leadership Turnover, (c) Ratio of Students to Teachers and Administrators, (d) Percentage of Teachers Instructing in Their Degree Area, and (e) Percentage of Money Spent on Support Services. The means, standard deviations, and intercorrelations can be found in Table 4.18. The combination of variables predicted 2004-2005 Math CSAP scores, F (5, 148) = 47.37, $p < 0.0001$, with four of the five variables, Part 1 Residual, Percentage of Money Spent on Support Services, Instructional Leadership, and percentage of teachers instructing in the content area of their degree, significantly contributing to the prediction. The beta weights, presented in Table 4.19, suggest that the Previous Year's Residual contributes most to predicting next year's test scores. The adjusted R squared value was 0.602. This indicates a large to very large effect (Cohen, 1988) that 60% of the variance in Math CSAP scores was explained by the model.

Table 4.18

Means, Standard Deviations, and Intercorrelations for All Students CSAP Math Scores and Predictor Variables, Part 2 (N = 154)

Variable	*M*	*SD*	1	2	3	4	5
Math CSAP, All	0.477	0.133	0.741**	-0.216**	0.156*	-0.189**	0.075
Predictor variable							
1. Part 1 Residual	0.043	0.923	-	-0.168	0.091	0.032	-0.083
2. Instruction Leadership Turnover Percentage	0.037	0.982		-	0.036	0.055	0.065
3. Teaching in Area of Degree Percentage	0.771	0.132			-	-0.028	0.025
4. Support Services Dollar Percentage	0.335	0.082				-	-0.303**
5. Ratio Students to Other Professionals	0.212	0.875					-

* $p < 0.05$; ** $p < 0.01$.

Table 4.19

Simultaneous Multiple Regression Analysis Summary for All Students CSAP Math Scores and Predictor Variables, Part 2 (N = 154)

Variable	*B*	*SEB*	B
Part 1 Residual	0.105	0.007	0.731**
Instruction Leadership Turnover Percentage	-0.012	0.007	-0.092*
Teaching in Area of Degree Percentage	0.086	0.052	0.085*
Support Services Dollar Percentage	-0.289	0.087	-0.179**
Ratio Students to Teachers and Administrators	0.013	0.008	0.085
Constant	0.500	0.051	

Note. $R^2 = 0.602$; $F(5, 148) = 47.37$, $p < 0.0001$
$^*p < 0.10$; $^{**}p < 0.01$.

District Math APM, Latino American Students' Performance

Like the "District Math All" equation, the "District Math Latino American" is also broken into part 1 and part 2. The means, standard deviations, and intercorrelations for "Math Latino American, Part 1" can be found in Table 4.20. The two variables did not significantly predict 2003-2004 Latino American Math CSAP scores, $F(2, 78) = 7.852$, $p < 0.01$, meaning the residual saved for the

Table 4.20

Means, Standard Deviations, and Intercorrelations for Latino American Students CSAP Math Scores and Predictor Variables, Part 1 (N = 81)

Variable	*M*	*SD*	1	2
Math CSAP, Latino American 2003-2004 Advanced and Proficient	0.210	0.107	-0.356*	-0.337*
Predictor variable				
1. Income Compilation	-0.021	0.597	-	0.436*
2. ELL Compilation	0.686	0.817		-

** $p < 0.01$.

second part of the equation contains much explanatory potential. The beta weights, presented in Table 4.21, suggest both ELL Compilation and Income Compilation contribute to predicting 2004-2005 test scores. The adjusted *R* squared value was 0.146, indicating that only 15% of the variance in Latino American Math CSAP scores was explained by the two variables measuring characteristics beyond the district's control. This is a small effect (Cohen, 1988).

The second part of the equation was computed using multiple regression to predict the Math CSAP scores for Latino American students within each school district. The dependent variable was 2004-2005 Math CSAP scores for Latino American students, and the original independent variables included: (a) the

Table 4.21

Simultaneous Multiple Regression Analysis Summary for Latino American Students CSAP Math Scores and Predictor Variables, Part 1 (N = 81)

Variable	*B*	*SEB*	B
Income Compilation	-0.046	0.021	-0.258*
ELL Compilation	-0.029	0.015	-0.224*
Constant	0.229	0.015	

Note. $R^2 = 0.146$; $F(2, 78) = 7.85$, $p < 0.01$
* $p < 0.05$.

Residual Value from Part One, (b) Instructional Leadership, (c) Instructional Support, (d) Ratio of Students to Other Professionals, (e) Ratio of Students to Teachers and Administrators, (f) Years of Teaching Experience, (g) Percentage of Teachers Instructing in Their Degree Area, (h) Percentage of Days Teachers are Absent, (i) Teacher Salary, (j) Percentage of Money Spent on Instruction, and (k) Percentage of Money Spent on Support Services. The variables Percentage of Money Spent on Instruction, Percentage of Money Spent on Support, Teacher Salary, Years of Teaching Experience, and Percentage of Teachers Instructing in Their Degree Area were removed because the variables demonstrated extreme insignificance or low beta scores.

Thus, the regression equation demonstrating greatest strength in predicting 2004-2005 Latino American Math CSAP scores included the following

independent variables: (a) the Residual Value from Part One, (b) Instructional Leadership Turnover, (c) Instructional Support turnover, (d) Ratio of Students to Teachers and Administrators, (e) Ratio of Students to Other Professionals, and (f) Percentage of Days Teachers are Absent. The means, standard deviations, and intercorrelations can be found in Table 4.22. The combination of variables predicted 2004-2005 Math CSAP scores, F (6, 72) = 30.812, $p < 0.0001$, with five of the six variables, Part 1 Residual, Instructional Leadership Turnover, Instructional Support turnover, Ratio of Students to Other Professionals, and Percentage of Days Teachers are Absent, significantly contributing to the prediction. The beta weights, presented in Table 4.23, suggest that previous year's residual contributes most to predicting next year's test scores, while the other factors also add to the prediction. The adjusted R squared value was 0.70, indicating that 70% of the variance in Latino American Math CSAP scores, a very large effect (Cohen, 1988), was explained by the model.

Interpreting the Residuals

While calculating the regression equations, the standardized residual from each analysis was saved. The residuals, in essence, provide a measure to determine which school districts, when controlling for factors beyond the school districts' control, are performing above expectations and which are not performing high enough. The district-level residuals (see Table 4.24) range from 2.799 to -5.408.

Table 4.22

Means, Standard Deviations, and Intercorrelations for Latino American Students CSAP Math Scores and Predictor Variables, Part 2 (N = 79)

Variable	*M*	*SD*	1	2	3	4	5	6
Math CSAP, Latino American	0.299	0.118	0.788***	-0.166*	0.119	-0.012**	-0.041	0.370***
Predictor variable								
1. Part 1 Residual	0.044	0.956	-	0.004	-0.105	-0.091	-0.118	0.299***
2. Instructional Leadership Turnover Percentage	-0.073	0.634	-	-	-0.264***	0.027	0.327***	-0.031
3. Ratio of Students to Other Professionals	109.630	41.674	-	-	-	-	-0.186**	-0.173*
4. Teacher Days Absent Percentage	0.057	0.018	-	-	-	-	-0.127	-0.286***
5. Instructional Support Turnover Percentage	0.276	0.689	-	-	-	-	-	0.117
6. Ratio Students to Teachers and Administrators	0.627	0.766	-	-	-	-	-	-

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Table 4.23

Simultaneous Multiple Regression Analysis Summary for Latino American Students CSAP Math Scores and Predictor Variables, Part 2 (N = 79)

Variable	*B*	*SEB*	B
Part 1 Residual	0.099	0.008	0.806**
Instructional Leadership	-0.031	0.013	-0.169*
Ratio of Students to Other Professionals	0.001	0.000	0.191**
Teacher Days Absent Percentage	0.989	0.431	0.152*
Instructional Support Turnover Percentage	0.025	0.012	0.148*
Ratio Students to Teachers and Administrators	0.017	0.011	0.113
Constant	0.159	0.037	

Note. $R^2 = 0.541$; $F(4, 75) = 24.243$, $p < 0.0001$
* $p < 0.05$; ** $p < 0.01$.

If a school district's students were performing exactly at their expected level, the school district's residual value would be 0.00. Additionally, the residual value for a school district whose students are performing above their expected level would be a positive number. On the other hand, the residual value for a school district whose students are performing below their expected level would be a negative number.

Table 4.24

District-Level Residual Values

	All Students		Latino American Students	
Residual Value	Reading	Math	Reading	Math
High	2.799	2.076	1.632	2.236
Low	-2.495	-3.193	-5.408	-2.816

Analyzing District Differences

Once each school district's performance score from their residual value was determined, the school districts were organized by their residual value. The data set was separated into five categories for further analysis. The districts were split into five categories based on residual scores: (a) Above APM, (b) Moderately Above APM, (c) Average APM, (d) Moderately Below APM, and (e) Below APM. The total number of students in each data set was calculated and divided by five in order to determine the number of students who should be represented per quintile.

Once category lines were drawn, comparisons were made based on the setting of the districts: (a) Denver metro-area, (b) urban-suburban, (c) outlying city, (d) outlying town, and (e) rural, as determined by Colorado Department of Education

(n.d.). In an attempt to identify differences between the groups, it is important to distinguish between these five sets.

District Setting and APM Categories

The first step in identifying differences between APM categories was to explore patterns of district setting and APM rating. The findings from this division of district setting by APM residuals are illustrated in Tables 4.25, 4.26, 4.27, and 4.28. The districts located within Denver-Metro appear to be more successful with Latino American Reading scores than the other three areas. Math Latino American Scores appear to be an area of strength for the districts within the Urban-Suburban classification. With the other three categories, no glaring trends are obvious.

Interpreting the APM Residual Categories

After dividing the APM residual categories by district setting, the means were calculated for each category. Breaking the APM residuals into five categories makes variation easier to discern within the categories. Interestingly, although the regression analysis controlled for factors such as percentages of Free and Reduced Lunch, Special Education enrollment, and English Language Learner enrollment, differences in some of these factors were apparent between the categories. For instance, as Free and Reduced Lunch and English Language Learner enrollments increased, the APM residuals decreased. Likewise, as noted in Table 4.29, a negative

Table 4.25

Reading All APM Divided into Five Categories (N = 155)

	Denver-Metro	Urban-Suburban	Outlying City	Outlying Town	Rural	Student Count
Above APM	2 (13%)	5 (33%)	2 (15%)	16 (36%)	20 (30%)	136,346
Moderately Above APM	2 (13%)	3 (20%)	-	-	7 (10%)	139,939
Average APM	3 (20%)	3 (20%)	2 (15%)	3 (06%)	3 (04%)	172,509
Moderately Below APM	3 (20%)	4 (27%)	7 (54%)	22 (49%)	31 (46%)	155,259
Below APM	5 (33%)	-	2 (15%)	4 (08%)	6 (08%)	149,087
Total Districts	15	15	13	45	67	

Table 4.26

Reading Latino American APM Divided into Five Categories (N = 80)

	Denver-Metro	Urban-Suburban	Outlying City	Outlying Town	Rural	Student Count
Above APM	4 (27%)	2 (14%)	1 (08%)	5 (18%)	4 (36%)	144,557
Moderately Above APM	3 (20%)	1 (07%)	4 (33%)	8 (29%)	1 (10%)	139,678
Average APM	2 (13%)	2 (14%)	-	1 (04%)	-	142,394
Moderately Below APM	4 (27%)	2 (14%)	3 (25%)	4 (14%)	4 (36%)	144,532
Below APM	2 (13%)	7 (50%)	4 (33%)	10 (36%)	2 (18%)	144,913
Total Districts	15	14	12	28	11	

Table 4.27

Math All APM Divided into Five Categories (N = 154)

	Denver-Metro	Urban-Suburban	Outlying City	Outlying Town	Rural	Student Count
Above APM	1 (07%)	5 (33%)	4 (31%)	22 (49%)	28 (42%)	162,452
Moderately Above APM	2 (13%)	3 (20%)	1 (08%)	1 (02%)	5 (08%)	142,689
Average APM	3 (20%)	3 (20%)	2 (15%)	8 (18%)	12 (18%)	144,859
Moderately Below APM	4 (27%)	3 (20%)	4 (31%)	8 (18%)	15 (23%)	145,818
Below APM	5 (33%)	1 (07%)	2 (15%)	6 (13%)	10 (15%)	157,120
Total Districts	15	15	13	45	66	

Table 4.28

Math Latino American APM Divided into Five Categories (N = 79)

	Denver-Metro	Urban-Suburban	Outlying City	Outlying Town	Rural	Student Count
Above APM	1 (07%)	7 (50%)	3 (25%)	8 (29%)	2 (20%)	144,382
Moderately Above APM	3 (20%)	5 (36%)	3 (25%)	5 (18%)	1 (10%)	154,524
Average APM	2 (13%)	-	-	2 (07%)	-	136,761
Moderately Below APM	4 (27%)	1 (07%)	1 (08%)	2 (07%)	3 (30%)	159,210
Below APM	5 (33%)	1 (07%)	5 (42%)	11 (39%)	4 (40%)	120,584
Total Districts	15	14	12	28	10	

Table 4.29

APM Residual Category Means

	Reading-All			Reading-Latino American			Math-All			Math-Latino American		
	Latino Enroll %	FRL %	ELL %	Latino Enroll %	FRL %	ELL %	Latino Enroll %	FRL %	ELL %	Latino Enroll %	FRL %	ELL %
1	12.0	23.7	4.0	23.2	30.3	4.1	13.4	29.2	3.6	25.6	31.7	3.9
2	12.9	26.6	2.9	42.3	45.7	13.0	20.2	29.6	6.2	25.9	35.5	7.3
3	20.4	32.0	6.8	34.6	45.0	12.5	25.3	38.7	6.1	28.5	34.3	18.4
4	28.3	45.3	8.6	36.4	42.6	20.2	25.8	44.3	10.8	47.8	47.9	18.4
5	50.0	63.4	25.0	40.9	49.4	22.3	48.8	61.0	24.0	42.43	50.0	22.5

Note. Data are the APM residual category means for the 2004-2005 school year. Categories on left are equal to (1) Above APM, (2) Moderately Above APM, (3) Average APM, (4) Moderately Below APM, and (5) Below APM.

correlation was evident with Latino American student enrollment percentages and APM residuals.

Factors Within District Control

Differences were noted between the categories for factors within a school district's control (Table 4.30). For example, in each of the four areas, the Above APM Residual category had more years of teaching experience than the lowest category. Similarly, in the Above APM Residual category, the percentage of teachers instructing within their degree area was greater than the Below APM Residual category. The average teacher salary, often correlating with years of teaching experience and level of highest college degree, is higher with the Above APM category than with the Below APM category.

Additionally, distinctions were noted between the districts rated Above APM and those rated Below APM in the ratios of teachers and administrators to students (see Table 4.31). For example, in the Math All category, the Above APM districts had a mean student to teacher ratio of 14.42 whereas the Below APM districts had a mean student to teacher ratio of 15.58. Likewise, in the Above APM Residual category, the Ratio of Students to Administrators was 147.17 while the Below APM districts had a mean of 169.74. The differences in the Math Latino American and Reading categories were not as substantial.

Finally, variations were evident in the percentage of district budget spent on Other Expenses. The district's spending was divided into (a) instructional expenses,

Table 4.30

Factors Within School Districts' Control

	Years Experience		Degree Area		Salary	
	Above	Below	Above	Below	Above	Below
Reading-All	11.6	11.4	73.6	72.9	38,165	37,312
Reading-Latino	12.0	11.6	77.4	75.6	40,003	38,826
Math-All	12.0	11.3	76.4	73.0	37,713	36,350
Math-Latino	11.5	11.2	80.1	75.5	39,125	39,605

Note. Data are the APM residual category means for the 2004-2005 school year.

Table 4.31

Math All Professionals to Student Ratios

	Professionals to Student Ratios	
	Teachers	Administrators
Above APM Districts	14.42	147.17
Below APM Districts	15.58	169.74

Note. Data are the APM residual category means for the 2004-2005 school year.

(b) support services expenses, and (c) other expenses. The districts in the Above APM category spent a greater percentage of their budget on Other Expenses than the districts in the Below APM category. Although differences were noted in each of the four groups (see Table 4.32), the greatest distinction was the Reading Latino American group with a 1.76% mean difference between the Above APM and Below APM categories.

Table 4.32

District Spending on Other Expenses

	Above APM Districts	Below APM Districts
Reading-All	18.5%	16.9%
Reading-Latino	21.8%	20.4%
Math-All	18.5%	16.9%
Math-Latino	22.6%	20.8%

Note. Data are the APM residual category means for the 2004-2005 school year.

Factors Beyond District Control

In addition to the differences in factors within the district's control, further variations were noted in factors beyond the district's control. Distinctions in per

pupil revenue and percentage of the district's total revenue were clear between the Above APM and Below APM categories (see Table 4.33). In each of the four categories, the districts in the Above APM category received between $222 and $747 less in per pupil funding than the districts in the Below APM category.

For the districts in the Above APM category, the percentage of District Revenue received from local sources was much higher than they were for the districts in the Below APM category (see Table 4.33). Like the differences in per pupil revenue, local funding percentages, in each of the four categories, were between 08% and 19% higher than the districts in the Below APM category. A higher percent of funding from local sources often means higher local property values, which is often the case in more affluent neighborhoods.

District-Level Conclusions

In conclusion, analyzing district's performance on the CSAP, while adjusting for factors beyond the district's control, creates a less biased view of district achievement. Understanding how districts are performing when adjusting for factors beyond their control further enables educators and policy makers to make informed decisions on what is truly working for All students and what is working for Latino American students. The findings from this study demonstrate that sometimes what works for All students is the same as what works best for Latino American students, and sometimes it is different.

Table 4.33

Factors Beyond District Control

	Per Pupil Revenue		Local Funding	
	Above APM	Below APM	Above APM	Below APM
Reading-All	$8737.36	$9484.65	47.9%	28.7%
Reading-Latino	$7637.24	$8295.25	42.1%	34.4%
Math-All	$8846.18	$9068.50	45.2%	29.6%
Math-Latino	$7680.86	$8015.38	41.9%	30.6%

Note. Data are the APM residual category means for the 2004-2005 school year.

The factors that were determined significant in predicting higher achievement scores provide additional information in understanding student learning. Furthermore, comparing the means between the Above APM districts and the Below APM districts enhances the knowledge base needed to compare factors present in higher achieving districts to those in lower achieving districts. The next chapter, Chapter 5, moves into a school-level examination of potential differences within districts.

CHAPTER 5

SCHOOL-LEVEL FINDINGS

The first part of the study, discussed in Chapter 4, adjusted student and school characteristics beyond the control of an individual school district. The second part of the study, discussed in this chapter, adjusted for those characteristics beyond the control of individual schools. As in the district-level analysis, the school-level analysis uses adjusted performance measures (APM).

The APM for this study were developed using regression equations where Math and Reading CSAP scores are the dependent variables. The independent variables consist of factors beyond and within the control of the school. The independent variables measure Student Characteristics, Teacher Quality Factors, Ratio of Students to Professionals, and Leadership Experience (see Figure 5.1). In addition, the Previous Year's CSAP Scores were included as independent variables to provide a measure of growth over the year. APM evaluate the difference between the actual school CSAP scores and the predicted CSAP scores from the regression equation (Steifel et al., 2005).

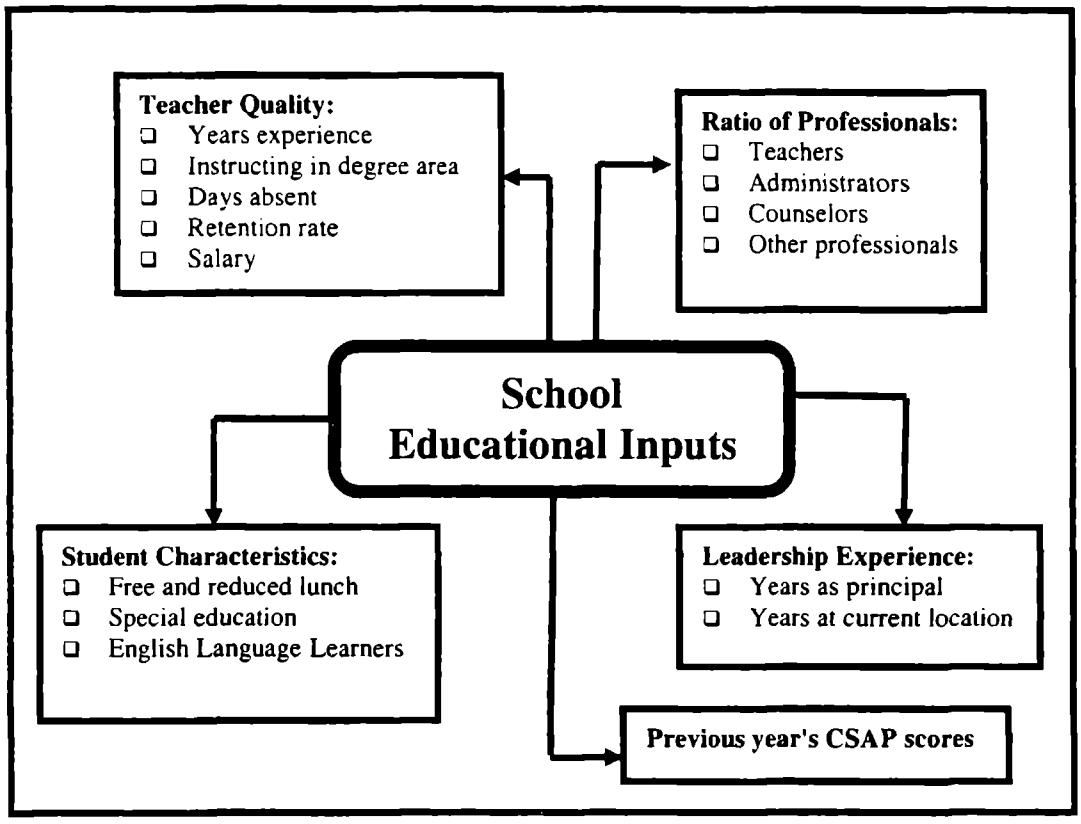

Figure 5.1. School-Level Educational Input Variables

Principal Components Analysis

The first step of my data analysis was to complete principal component analyses (PCA) on three categories: Student Characteristics, Teacher Quality factors, and Ratio of Students to Professionals. Again, the purpose of using PCA is to reduce multicollinearity and use fewer variables while retaining the critical concepts provided by the original, larger set of variables. The findings from the PCA are outlined in the next three sections.

Uncontrollable School Factors

The Uncontrollable School Factors include the following: (a) free and reduced lunch participants, (b) special education participants, and (c) English Language Learners. A principal components analysis, using varimax rotation, was performed because the independent variables were correlated and need to be independent while retaining as much of the information from the original measured variables as possible. I computed the PCA first with all three of the factors, but raw data was used for special education participants because it did not correlate as highly with the other two variables. The variable, SPED Enrollment was added into the regression equation. Next, PCA was used for free and reduced lunch participants and English Language Learners.

The assumptions for the PCA were checked and met. The determinant should be more than 0.00001 (Leech et al., 2005), and here it was 0.520. Again, if the determinant is less than 0.00001, then a factor analytic solution is not available because it requires dividing by zero (Leech et al.). The Kaiser-Meyer-Olkin (KMO) measure needs to be 0.50 to tell whether enough items are predicted by each factor (Leech et al.). The KMO was 0.500, which met the regulation limit. Finally, the significance level was 0.0001 which met the significance measure since it is below 0.050 (Leech et al.).

One component was extracted from the analysis of the two variables. The component (see Table 5.1) explained 84.6% of the variance. Table 5.2 displays the

component matrix with component loadings (see Appendix D for additional information). Based upon the findings from the PCA calculated on Student Characteristics, this component was used to measure these variables. The component Student Background was added to the regression equation.

Table 5.1

Student Characteristics Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.693	84.640	84.640	1.693	84.640	84.640
2	0.307	15.360	100.000			

Table 5.2

Student Characteristics Component Matrix

	Component Loading
	1
Free and reduced lunch percentage	0.920
English Language Learners percentage	0.920

Teacher Quality

The Teacher Quality variables include the following: (a) Years of Teaching Experience, (b) percentage of teachers instructing courses in their degree area, (c) Percentage of Days Teachers are Absent, (d) teacher retention percentage, and (e) Teacher Salary. Because the percentage of teachers instructing courses in their degree area did not correlate highly with the other Teacher Quality variables, the raw data for this variable was entered into the regression equation. The variable Teacher Degree Area was entered into the regression equation. The second PCA was performed using varimax rotation. Two components were extracted from the analysis. After rotation (see Table 5.3), the first component accounted for 49.8% of the variance and the second component accounted for 30.6% of the variance, together explaining 80.4% of the variance. Table 5.4 displays the rotated component matrix with loadings less than 0.40 omitted for improved clarity (see Appendix E for additional information).

The assumptions for the PCA were checked and met. The determinant was 0.201 showing that it was met (Leech et al., 2005). The KMO was 0.532, which meets the regulation limit (Leech et al.). Finally, the significance level was 0.0001 which met the significance measure of falling below 0.050 (Leech et al.).

The first component (see Table 5.4), which seems to indicate teacher experience, loads strongly on years of teaching experience and salary and loads moderately on teacher retention. The second component, which seems to track

teaching culture, loads strongly on days teachers are absent with a negative loading on teacher retention (see Appendix F for additional information).

Table 5.3

Teacher Quality Total Variance Explained

	Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.111	52.777	52.77	1.992	49.795	49.795
2	1.104	27.610	80.387	1.224	30.593	80.387

Table 5.4

Teacher Quality Rotated Component Matrix

	Component Loading	
	1	2
Years of Teaching Experience	0.943	-
Days Absent	-	0.900
Salary	0.944	-
Teacher Retention	0.450	-0.624

As a result of my findings from the PCA, I reduced four variables (Years of Teaching Experience, Days Teachers are Absent, Teacher Salary, and Teacher Retention) to two variables (Teacher Experience and Teaching Culture). These two variables, Teacher Experience and Teaching Culture, were added to the regression equation. Using the components extracted from the PCA generates variable independence, reduce multicollinearity, and use fewer variables while retaining the critical concepts provided by the original, larger set of variables.

Ratio of Students to Professionals

The Ratio of Students to Professionals variable included the ratio of students to (a) teachers, (b) building administrators, and (c) counselors. Again, because the ratio of students to counselors did not correlate highly with the other two variables, the raw data for counselor to students was used in the equation. So, the variable Counselors to Students was added to the regression equation. Next, I administered another PCA, again with varimax rotation, on the ratio of students to teachers and to building administrators. The assumptions for the PCA were checked and met with the determinant score of 0.494 and the KMO measure of 0.500 (Leech et al., 2005). Finally, the significance level was 0.0001 which met the significance measure of measuring below 0.050 (Leech et al.).

One component was extracted from the PCA. After rotation (see Table 5.5), the component accounted for 85.6% of the variance. The component matrix (see

Table 5.6) shows a high loading of Student to Teacher Ratio and Ratio of Student to Administrator.

Table 5.5

Ratio of Students to Professionals Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.712	85.577	85.577	1.712	85.577	85.577
2	0.288	14.423	100.000			

Table 5.6

Ratio of Professionals Component Matrix

	Component Loading
	1
Teachers to students	0.925
Building administrators to students	0.925

Based upon the findings from this PCA, one component, measuring Student Ratio to Teachers and Building Administrators, was extracted. Apparently this component measured instructional staff to students. Hence, the variable Students to Instructional Staff was entered into the regression equation.

Regression Equation

After conducting the PCA, I created the regression equations. The purpose of the first part of the regression analysis (see Figure 5.2) was to predict the Previous Year's CSAP Scores while adjusting for the factors beyond the school's control. This part of the regression equation was performed four different times. The first part of the analysis predicted the school's 2003-2004 Reading CSAP scores for all students. The second analysis predicted Reading CSAP scores for the school's Latino American students. The third analysis predicted the school's 2003-2004 Math CSAP scores for all students, and the fourth predicted the scores of Latino American students.

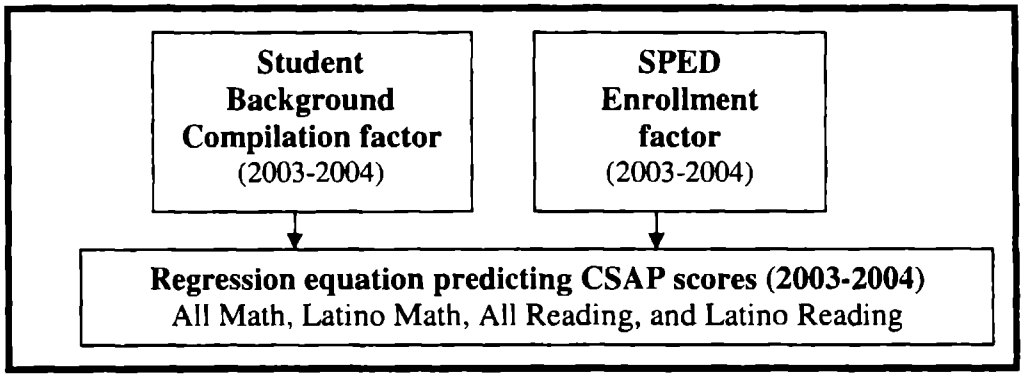

Figure 5.2. School Regression Equation, Part One.

Next, the standardized residuals were used from each regression to create four new variables, "Reading Residual, All Students," "Reading Residual, Latino American Students," "Math Residual, All Students," and "Math Residual, Latino American Students." Each new variable was saved, later to be entered into the second part of the equation as an independent variable where 2004-2005 CSAP scores were predicted.

The purpose of the second part of regression equations (see Figure 5.3) was to predict 2004-2005 CSAP scores. By predicting the expected scores, a measure is created to determine which schools within two districts, when considering all factors, are performing at higher levels than expected and which are performing below their expected level. Again, as in part one, the second part of the regression equation was completed four different times. Also, the standardized residuals from each of these equations were saved. The purposes of these standardized residuals are discussed in the section titled, Interpreting the Residuals.

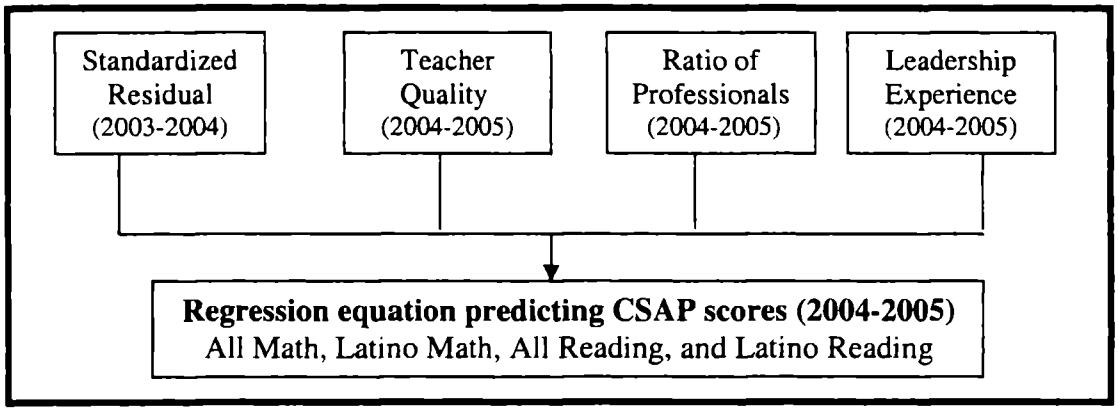

Figure 5.3. School Regression Equation, Part Two.

School Reading APM, All Students' Performance

The regression equation is broken into two parts. The first part predicts 2003-2004 Reading CSAP from the Student Background Compilation and the SPED Enrollment. From the prediction, the standardized residual is saved and added to the second part of the regression equation. By using the residual value in the equation, I am able to measure the other aspects predicting 2003-2004 that are not related to factors beyond the district's control.

The means, standard deviations, and intercorrelations for "Reading All, Part 1" can be found in Table 5.7. The two variables did predict 2003-2004 Reading CSAP scores, $F(2, 81) = 236.511, p < 0.000$. The beta weights, presented in Table 5.8, suggest the Student Background Compilation contributes most to predicting 2003-2004 CSAP Reading test scores, while SPED Enrollment also adds to the prediction. The adjusted R squared value was 0.850, indicating that 85% of the variance in Reading CSAP scores was explained by the two variables measuring characteristics beyond the school's control. Eighty-five percent is considered a very large effect (Cohen, 1988).

The second part of the equation was done using multiple regression to predict the Reading CSAP scores for all students within each school. The dependent variable was 2004-2005 Reading CSAP scores for All students, and the original independent variables included (a) Part One Residual, (b) Teacher Experience, (c) Teaching Culture, (d) Teacher Degree Area, (e) Instructional Staff to Students, (f) Counselors

Table 5.7

Means, Standard Deviations, and Intercorrelations for All Students' CSAP Reading Scores and Predictor Variables, Part 1 (N = 84)

Variable	*M*	*SD*	1	2
Reading CSAP, All 2003-2004 Advanced and Proficient	0.529	0.260	-0.885*	-0.529*
Predictor variable				
1. Student Background Compilation	0.000	1.000	-	0.311*
2. SPED Enrollment	0.111	0.066		-

* $p < 0.01$.

Table 5.8

Simultaneous Multiple Regression Analysis Summary for All Students' CSAP Reading Scores and Predictor Variables, Part 1 (N = 84)

Variable	*B*	*SEB*	B
Student Background Compilation	-0.207	0.012	-0.797*
SPED Enrollment	-1.102	0.175	-0.281*
Constant	0.661	0.022	

Note. $R^2 = 0.850$; $F(2, 81) = 236.511$, $p < 0.0001$
* $p < 0.01$.

to Students, (g) Leader Total Years of Experience, and (h) Leader Total Years at School. The variable Counselors to Students was removed because it demonstrated extreme insignificance and a low beta score.

For these reasons, the regression equation demonstrating greatest strength in predicting 2004-2005 Reading CSAP scores included the following independent variables: (a) Part One Residual, (b) Teacher Experience, (c) Teaching Culture, (d) Teacher Degree Area, (e) Instructional Staff to Students, (f) Leader Total Years of Experience, and (g) Leader Total Years at School. The means, standard deviations, and intercorrelations can be found in Table 5.9. The combination of variables predicted 2004-2005 Reading CSAP scores, F (7, 73) = 14.260, $p < 0.0001$, with six of the seven variables significantly contributing to the prediction. The beta weights, presented in Table 5.10, suggest that Teacher Degree Area and the Previous Year's Residual contributes most to predicting next year's test scores, while the other factors also contribute to the prediction. The adjusted R squared value was 0.54, indicating that 54% of the variance in Reading CSAP scores, a large effect (Cohen, 1988), was explained by the model.

Table 5.9

Means, Standard Deviations, and Intercorrelations for All Students' CSAP Reading Scores and Predictor Variables, Part 2 (N = 81)

Variable	*M*	*SD*	1	2	3	4	5	6	7
Reading CSAP, All	0.532	0.267	0.369**	0.485**	-0.347**	-0.490**	0.447**	-0.071	0.227**
Predictor variable									
1. Part 1 Residual	0.217	0.948	-	0.134	-0.261	-0.117	0.039	0.225**	0.189**
2. Teacher Experience	0.018	0.974		-	-0.095	0.369**	0.339**	-0.073	0.170*
3. Teaching Culture	0.109	0.860			-	-0.199**	-0.197**	0.209**	0.109
4. Teacher Degree Area	0.691	0.112				-	0.329	-0.004	0.013
5. Instructional Staff to Students	0.071	0.912					-	-0.052	0.109
6. Leader Total Years of Experience	5.470	4.861						-	0.304**
7. Leader Total Years at School	2.960	2.400							-

*$p < 0.10$; **$p < 0.05$.

Table 5.10

Simultaneous Multiple Regression Analysis Summary for All Students' CSAP Reading Scores and Predictor Variables, Part 2 (N = 81)

Variable	*B*	*SEB*	B
Part 1 Residual	0.100	0.025	0.355*
Teacher Experience	0.050	0.024	0.183*
Teaching Culture	-0.034	0.027	-0.109
Teacher Degree Area	0.890	0.210*	0.374*
Instructional Staff to Students	0.059	0.025	0.201*
Leader Total Years of Experience	-0.008	0.005	-0.151**
Leader Total Years at School	0.018	0.009	0.160**
Constant	-0.094	0.148	

Note. $R^2 = 0.537$; $F(7, 73) = 14.26$, $p < 0.0001$
* $p < 0.05$; ** $p < 0.10$.

School Reading APM, Latino American Students' Performance

Like the School Reading All equation, the School Reading Latino American equation is also broken into part 1 and part 2. The means, standard deviations, and intercorrelations for "Reading Latino American, Part 1" can be found in Table 5.11. The two variables did significantly predict 2003-2004 Latino American Reading CSAP scores, $F(2, 70) = 83.585$, $p < 0.0001$. The beta weights, presented in Table

Table 5.11

Means, Standard Deviations, and Intercorrelations for Latino American Students' CSAP Reading Scores and Predictor Variables, Part 1 (N = 73)

Variable	*M*	*SD*	1	2
Reading CSAP, Latino American 2003-2004 Advanced and Proficient	0.377	0.201	-0.777**	-0.507**
Predictor variable				
1. Student Background Compilation	0.142	0.996	-	0.258*
2. SPED Enrollment	0.116	0.067		-

* $p < 0.05$; ** $p < 0.01$.

5.12, suggest the Student Background Compilation contributes most to predicting 2003-2004 CSAP test scores, while SPED Enrollment also adds to the prediction. The adjusted *R* squared value was 0.696, indicating that 70% of the variance in Latino American Reading CSAP scores was explained by the two variables measuring characteristics beyond the school's control. According to Cohen (1988), this is a very large effect.

The second part of the equation was performed using multiple regression to predict the Reading CSAP scores for Latino American students within each school. The dependent variable was 2004-2005 Reading CSAP scores for All students, and

Table 5.12

Simultaneous Multiple Regression Analysis Summary for Latino American Students' CSAP Reading Scores and Predictor Variables, Part 1 (N = 73)

Variable	*B*	*SEB*	B
Student Background Compilation	-0.140	0.014	-0.693*
SPED Enrollment	-0.981	0.201	-0.329*
Constant	0.510	0.026	

Note. $R^2 = 0.696$; $F\ (2, 70) = 83.585$, $p < 0.0001$
* $p < 0.01$.

the original independent variables included (a) Part One Residual, (b) Teacher Experience, (c) Teaching Culture, (d) Teacher Degree Area, (e) Instructional Staff to Students, (f) Counselors to Students, (g) Leader Total Years of Experience, and (h) Leader Total Years at School. Teaching Culture, Counselors to Students, Leader Total Years of Experience, and Leader Total Years at School were removed from the equation because the variables demonstrated low beta scores.

Consequently, the regression equation demonstrating greatest strength in predicting Latino American Reading 2004-2005 CSAP scores included the following independent variables: (a) Part One Residual, (b) Teacher Experience, (c) Teacher Degree Area, and (d) Instructional Staff to Students. The means, standard deviations, and intercorrelations can be found in Table 5.13. The combination of variables predicted 2004-2005 Reading CSAP scores, $F\ (4, 67) = 15.591$, $p < 0.0001$, with all

Table 5.13

Means, Standard Deviations, and Intercorrelations for Latino American Students' CSAP Reading Scores and Predictor Variables, Part 2 (N = 72)

Variable	*M*	*SD*	1	2	3	4
Reading CSAP, Latino American	0.390	0.209	0.268*	0.468**	0.478**	0.533**
Predictor variable						
1. Part 1 Residual	0.034	0.948	-	0.163	-0.048	0.175
2. Teacher Experience	-0.001	0.974		-	0.307**	0.312**
3. Teacher Degree Area	0.687	0.107			-	0.331**
4. Instructional Staff to Students	0.093	0.932				-

*$p < 0.05$; **$p < 0.01$.

four of the variables significantly contributing to the prediction. The beta weights, presented in Table 5.14, suggest that the previous year's residual and the Teacher Degree Area contribute most to predicting 2004-2005 CSAP test scores, while the other factors also add to the prediction. The adjusted *R* squared value was 0.451 which indicates a medium to large effect (Cohen, 1988). The adjusted *R* squared value demonstrates that 45% of the variance in Latino American Reading CSAP scores was explained by the model.

Table 5.14

Simultaneous Multiple Regression Analysis Summary for Latino American Students' CSAP Reading Scores and Predictor Variables, Part 2 (N = 72)

Variable	*B*	*SEB*	B
Part 1 Residual	0.041	0.020	0.187*
Teacher Experience	0.052	0.021	0.243**
Teacher Degree Area	0.593	0.118	0.305**
Instructional Staff to Students	0.073	0.022	0.324**
Constant	-0.025	0.130	

Note. $R^2 = 0.451$; $F(4, 67) = 15.591$, $p < 0.0001$
* $p < 0.05$; ** $p < 0.01$.

School Math APM, All Students' Performance

The means, standard deviations, and intercorrelations for "Math All, Part 1" can be found in Table 5.15. The two variables did predict 2003-2004 Math CSAP scores, $F(2, 81) = 74.47$, $p < 0.0001$. The beta weights, presented in Table 5.16, suggest the Student Background Compilation contributes most to predicting 2003-2004 CSAP test scores, while SPED Enrollment also contributes to the prediction. The adjusted R squared value was 0.639, indicating that 64% of the variance in Reading CSAP scores was explained by these two variables, measured characteristics beyond the school's control. This is a large to very large effect (Cohen, 1988).

Table 5.15

Means, Standard Deviations, and Intercorrelations for All Students' CSAP Math Scores and Predictor Variables, Part 1 (N = 84)

Variable	*M*	*SD*	1	2
Math CSAP, All 2003-2004 Advanced and Proficient	0.316	0.244	-0.758*	-0.493*
Predictor variable				
1. Student Background Compilation	0.0000	1.0000	-	0.311*
2. SPED Enrollment	0.111	0.066		-

* $p < 0.01$.

Table 5.16

Simultaneous Multiple Regression Analysis Summary for All Students' CSAP Math Scores and Predictor Variables, Part 1 (N = 84)

Variable	*B*	*SEB*	B
Student Background Compilation	-0.163	0.017	-0.669*
SPED Enrollment	-1.048	0.255	-0.285*
Constant	0.431	0.032	

Note. $R^2 = 0.639$; $F(2, 81) = 74.468$, $p < 0.0001$
* $p < 0.01$.

The second part of the equation was completed using multiple regression to predict the Math CSAP scores for All students within each school. The dependent variable was 2004-2005 Math CSAP scores for All students, and the original independent variables included (a) Part One Residual, (b) Teacher Experience, (c) Teaching Culture, (d) Teacher Degree Area, (e) Instructional Staff to Students, (f) Counselors to Students, (g) Leader Total Years of Experience, and (h) Leader Total Years at School. Teaching Culture and Counselors to Students were removed because the variables demonstrated low beta scores.

As a result, the regression equation demonstrating greatest strength in predicting 2004-2005 Math CSAP scores included the following independent variables: (a) Part One Residual, (b) Teacher Experience, (c) Teacher Degree Area,

(d) Instructional Staff to Students, (e) Leader Total Years of Experience, and (f) Leader Total Years at School. The means, standard deviations, and intercorrelations can be found in Table 5.17. The combination of variables predicted 2004-2005 Math CSAP scores, F (6, 73) = 29.093, $p < 0.0001$, with five of the six variables significantly contributing to the prediction. The beta weights, presented in Table 5.18, suggest that Part One Residual contributes most to predicting 2004-2005 CSAP scores, while the other factors also contribute to the prediction. The adjusted R squared value was 0.681, indicating that 68% of the variance in Math CSAP scores, a large to very large effect (Cohen, 1988), was explained by the model.

School Math APM, Latino American Students' Performance

Like the District Math All equation, the District Math Latino American equation is also broken into part 1 and part 2. The means, standard deviations, and intercorrelations for "Math Latino American, Part 1" can be found in Table 5.19. The two variables did predict 2003-2004 Latino American Math CSAP scores, F (2, 68) = 30.585, $p < 0.0001$. The beta weights, presented in Table 5.20, suggest Student Background Compilation and SPED Enrollment contribute to predicting 2003-2004 CSAP scores. The adjusted R squared value was 0.458, indicating that 46% of the variance in Latino American Math CSAP scores was explained by the two variables measuring characteristics beyond the school's control. According to Cohen (1988), this is a medium to large effect.

Table 5.17

Means, Standard Deviations, and Intercorrelations for All Students' CSAP Math Scores and Predictor Variables, Part 2 (N = 80)

Variable	*M*	*SD*	1	2	3	4	5	6
Math CSAP, All	0.326	0.245	0.545***	0.446***	0.377***	0.373***	-0.082	0.215**
Predictor variable								
1. Part 1 Residual	-0.027	0.921	-	0.068	-0.225**	-0.099	0.126	0.159*
2. Teacher Experience	0.046	0.948		-	0.319***	0.299***	-0.091	0.177*
3. Teacher Degree Area	0.694	0.108			-	0.283***	-0.022	0.014
4. Instructional Staff to Students	0.094	0.894				-	-0.067	0.112
5. Leader Total Years of Experience	5.500	4.883					-	0.304***
6. Leader Total Years at School	2.960	2.415						-

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Table 5.18

Simultaneous Multiple Regression Analysis Summary for All Students' CSAP Math Scores and Predictor Variables, Part 2 (N = 80)

Variable	*B*	*SEB*	B
Part 1 Residual	0.173	0.018	0.650**
Teacher Experience	0.044	0.018	0.171*
Teacher Degree Area	0.889	0.161	0.392**
Instructional Staff to Students	0.070	0.019	0.254**
Leader Total Years of Experience	-0.008	0.003	-0.152*
Leader Total Years at School	0.009	0.007	0.093
Constant	-0.281	0.114	

Note. $R^2 = 0.681$; $F(6, 73) = 29.093$, $p < 0.0001$
* $p < 0.05$; ** $p < 0.01$.

The second part of the equation was completed using multiple regression to predict the Math CSAP scores for Latino American students within each school. The dependent variable was 2004-2005 Math CSAP scores for Latino American students, and the original independent variables included (a) Part One Residual, (b) Teacher Experience, (c) Teaching Culture, (d) Teacher Degree Area, (e) Instructional Staff to Students, (f) Counselors to Students, (g) Leader Total Years of Experience, and (h) Leader Total Years at School. Teaching Culture, Counselors to Students, Leader

Table 5.19

Means, Standard Deviations, and Intercorrelations for Latino American Students' CSAP Math Scores and Predictor Variables, Part 1 (N = 71)

Variable	*M*	*SD*	1	2
Math CSAP, Latino American 2003-2004 Advanced and Proficient	0.170	0.143	-0.656*	-0.376*
Predictor variable				
1. Student Background Compilation	0.143	1.008	-	0.267*
2. SPED Enrollment	0.115	0.068		-

* $p < 0.01$.

Table 5.20

Simultaneous Multiple Regression Analysis Summary for Latino American Students' CSAP Math Scores and Predictor Variables, Part 1 (N = 71)

Variable	*B*	*SEB*	B
Student Background Compilation	-0.085	0.013	-0.598**
SPED Enrollment	-0.454	0.192	-0.216*
Constant	0.235	0.025	

Note. $R^2 = 0.458$; $F(2, 68) = 30.585$, $p < 0.0001$
* $p < 0.05$; ** $p < 0.01$.

Total Years of Experience, and Leader Total Years at School were removed because the variables demonstrated low beta scores.

Thus, the regression equation demonstrating greatest strength in predicting 2004-2005 Latino American Math CSAP scores included the following independent variables: (a) Part One Residual, (b) Teacher Experience, (c) Teacher Degree Area, and (d) Instructional Staff to Students. The means, standard deviations, and intercorrelations can be found in Table 5.21. The combination of variables predicted 2004-2005 Math CSAP scores, F (4, 66) = 35.832, $p < 0.0001$, with three of the four variables significantly contributing to the prediction. The beta weights, presented in Table 5.22, suggest Part One Residual contributes most to predicting 2004-2005 CSAP scores, while the other factors also contribute to the prediction. The adjusted R squared value was 0.66 which demonstrates a large to very large effect (Cohen, 1988). The adjusted R squared value indicates that 66% of the variance in Latino American Math CSAP scores was explained by the model.

Interpreting the Residuals

While conducting the regression equations, the standardized residuals were saved from each analysis. The residuals, in essence, provide a measure to determine which schools, when controlling for factors beyond the schools' control, are performing above expectations and which are not performing high enough. The school-level residuals (see Table 5.23) range from 3.079 to -2.830.

Table 5.21

Means, Standard Deviations, and Intercorrelations for Latino American Students' CSAP Math Scores and Predictor Variables, Part 2 (N = 71)

Variable	*M*	*SD*	1	2	3	4
Math CSAP, Latino American	0.201	0.167	0.675**	0.348**	0.188*	0.369**
Predictor variable						
1. Part 1 Residual	0.0000	0.986	-	0.107	-0.287**	-0.007
2. Teacher Experience	0.042	0.979		-	0.311**	0.309**
3. Teacher Degree Area	0.686	0.108			-	0.345**
4. Instructional Staff to Students	0.109	0.929				-

* $p < 0.10$; ** $p < 0.01$.

Table 5.22

Simultaneous Multiple Regression Analysis Summary for Latino American Students' CSAP Math Scores and Predictor Variables, Part 2 (N = 71)

Variable	*B*	*SEB*	B
Part 1 Residual	0.127	0.013	0.748*
Teacher Experience	0.018	0.013	0.104
Teacher Degree Area	0.443	0.124	0.287*
Instructional Staff to Students	0.044	0.014	0.243*
Constant	-0.108	0.086	

Note. $R^2 = 0.666$; $F(4, 66) = 35.832$, $p < 0.0001$
* $p < 0.01$.

Table 5.23

School-Level Residual Values

	All Students		Latino American Students	
Residual Value	Reading	Math	Reading	Math
High	2.362	1.883	2.627	3.079
Low	-2.830	-2.408	-1.699	-2.515

If a school's students were performing exactly at their expected level, the school's residual value would be 0.00. Additionally, the residual value for a school whose students are performing above their expected level would be a positive number. On the other hand, the residual value for a school whose students are performing below their expected level would be a negative number.

Analyzing School Differences

Once I determined each school's performance score from their residual value, I organized the schools by their residual value. Thus, the data set was separated into five categories for further analysis, and the districts were split into five categories based on residual scores: (a) Above APM, (b) Moderately Above APM, (c) Average APM, (d) Moderately Below APM, and (e) Below APM. The total number of students in each data set was calculated and divided by five in order to determine the number of students who should be represented per quintile.

Once category lines were drawn, comparisons were made based on the district where the schools are located. The secondary schools within two school districts were analyzed. The school districts, Exploration Public Schools (EPS) and Mountain View Public Schools (MVPS), were valid selections because they are large districts that serve economically and ethnically diverse student populations. To maintain anonymity, the names of the districts and the schools have been changed. For simplicity, the schools located within EPS have been given names of hiking trails

located within Colorado and the schools located within MVPS have been assigned names of mountain peaks in Colorado.

School Location and APM Categories

The first step in identifying differences between APM categories was to explore patterns of district location of the schools and APM category. The findings from this categorization of school location by APM residuals are illustrated in Tables 5.24 and 5.25. From the data, it appears that schools located within MVPS have more students performing well on the CSAP tests when controlling for characteristics beyond schools' influence. Stated another way, with all uncontrollable factors equal, students enrolled in MVPS are more likely to perform better on the CSAP than students enrolled in EPS.

Interpreting the APM Residual Categories

After dividing the APM residual categories by school district membership, the means were calculated for each category. Breaking the APM residuals into five categories makes variations easier to discern within the categories.

Factors Beyond School Control

Interestingly, although the regression analysis controlled for factors such as percentages of Free and Reduced Lunch, Special Education enrollment, and English Language Learner enrollment, notable differences

Table 5.24

Reading APM Categorized by District Membership

	EPS		MVPS	
	All	Latino	All	Latino
Above APM	4	4	15	13
Moderately Above APM	5	9	12	7
Average APM	12	3	3	7
Moderately Below APM	8	13	6	3
Below APM	11	10	5	3
Total Schools	**40**	**39**	**41**	**33**

Note. Reading, All $n = 81$ and Reading, Latino American $n = 71$.

in some of these factors were apparent between categories. For instance, as noted in Table 5.26 and Table 5.27, when Free and Reduced Lunch and English Language Learner enrollments increased, the APM residual decreased. Although the schools with the smallest Special Education enrollment ranked in the Above APM Residual category, the trend did not necessarily continue as the residuals decreased. For example, the Special Education enrollment is the second smallest in the middle APM Residual category.

Table 5.25

Math APM Divided by District Membership

	EPS		MVPS	
	All	Latino	All	Latino
Above APM	5	6	14	11
Moderately Above APM	7	5	9	7
Average APM	5	9	7	6
Moderately Below APM	12	7	4	7
Below APM	11	11	6	2
Total Schools	**40**	**38**	**40**	**33**

Note. Math, All $n = 80$, and Math, Latino American $n = 71$.

Similarly, as noted in Table 5.28 and Table 5.29, a negative correlation was evident with Latino American, Black American, and Other American student enrollment percentages and APM residuals. On the converse, a positive correlation was noted with White American student enrollment percentages and APM residuals.

Factors Within School Control

Differences were noted between the categories for factors within a school's control. For example, in each of the four areas, the schools in the Above APM

Table 5.26

Factors Beyond Schools' Control—Reading

	Free and Reduced Lunch Percentage		English Language Learners		Special Education Enrollment	
	All	Latino	All	Latino	All	Latino
Above	11.4	23.8	1.3	5.6	8.8	8.9
2	26.8	41.1	5.2	4.9	10.6	12.4
3	50.6	32.2	5.9	4.6	13.1	10.0
4	45.0	61.7	6.1	9.9	12.1	12.6
Below	64.2	63.4	18.6	17.3	11.4	14.8

Note. Data are reported as percentages and are the APM residual category means for the 2004-2005 school year.

Residual category had the fewest students enrolled in their school for both 2003-2004 and 2004-2005 school years (see Table 5.30). The schools with smaller enrollment numbers showed greater levels of achievement on the CSAP than expected.

The schools in the Above APM Residual category had teachers with the fewest years of experience (see Table 5.31). For example, teachers in the top category had between 9.0 and 9.4 years of experience, while the years of experience ranged from 9.6 to 10.9 in the other residual categories. The top performing schools also have a higher percentage of teacher absenteeism. Because teacher absenteeism is not differentiated in this study, the difference could be due to participation in

professional development opportunities. Also, although a definitive pattern is not observed, differences in teacher retention percentages seem to exist. In each of the four areas, the Top APM Residual category has one of the highest mean teacher retention percentages.

Table 5.27

Factors Beyond Schools' Control—Math

	Free and Reduced Lunch Percentage		English Language Learners		Special Education Enrollment	
	All	Latino	All	Latino	All	Latino
Above	22.0	30.8	3.9	4.2	9.4	10.6
2	29.5	30.6	3.7	3.3	9.6	11.1
3	35.7	60.6	6.1	8.2	11.9	12.5
4	65.4	45.6	10.8	9.8	12.3	11.2
Below	50.0	65.9	9.5	17.0	12.0	15.0

Note. Data are reported as percentages and are the APM residual category means for the 2004-2005 school year.

Table 5.28

Student Ethnicity—Reading

	White		Latino American		Black American		Other American	
	All	Latino	All	Latino	All	Latino	All	Latino
Above	83.9	70.3	10.2	19.5	2.3	6.2	3.5	4.1
2	67.0	50.9	20.2	33.9	8.8	10.4	3.8	4.9
3	33.4	58.4	38.1	24.8	23.3	12.2	5.2	4.6
4	42.5	27.7	39.9	52.0	13.4	15.8	4.2	4.4
Below	21.3	19.6	61.0	61.6	13.0	13.7	4.6	5.1

Note. Data are reported as percentages and are the APM residual category means for the 2004-2005 school year.

Residual category had the fewest students enrolled in their school for both 2003-2004 and 2004-2005 school years (see Table 5.30). The schools with smaller enrollment numbers showed greater levels of achievement on the CSAP than expected.

The schools in the Above APM Residual category had teachers with the fewest years of experience (see Table 5.31). For example, teachers in the top category had between 9.0 and 9.4 years of experience, while the years of experience ranged from 9.6 to 10.9 in the other residual categories. The top performing schools also have a higher percentage of teacher absenteeism. Because teacher absenteeism is not differentiated in this study, the difference could be due to participation in

Table 5.29

Student Ethnicity—Math

	White American		Latino American		Black American		Other American	
	All	Latino	All	Latino	All	Latino	All	Latino
Above	70.2	59.6	19.8	24.9	6.3	11.2	3.4	4.3
2	64.1	57.1	23.6	20.4	8.0	17.0	4.3	5.5
3	53.9	30.0	29.1	50.0	12.9	15.8	4.1	4.2
4	26.0	41.9	55.6	42.1	14.4	11.6	4.0	4.4
Below	35.4	21.4	45.7	61.0	13.8	13.4	5.1	4.3

Note. Data are reported as percentages and are the APM residual category means for the 2004-2005 school year.

professional development opportunities. Also, although a definitive pattern is not observed, differences in teacher retention percentages seem to exist. In each of the four areas, the Top APM Residual category has one of the highest mean teacher retention percentages.

Differences were noted between Ratio of Students to Professionals. Interestingly, for Reading All and Reading Latino American, the Lowest APM Residual category had the smallest teacher to student ratios (see Table 5.32). On the contrary, for Math All and Math Latino American, the Top APM Residual category

Table 5.30

Student Enrollment Numbers

	Read 03-04		Math 03-04		Read 04-05		Math 04-05	
	All	Latino	All	Latino	All	Latino	All	Latino
Above APM	744.5	709.6	734.8	734.0	747.9	716.8	738.8	745.5
2	881.6	859.5	789.3	1153.1	867.5	847.0	775.0	1140.8
3	1010.8	1253.2	1100.5	861.5	1004.2	1244.5	1084.3	824.5
4	1086.2	833.0	841.1	999.3	1049.5	819.0	784.1	950.0
Below APM	1021.2	1009.1	1096.5	957.5	984.8	976.5	1084.7	930.3

Note. Data are reported as percentages and are the APM residual category means for the 2003-2004 and 2004-2005 school years.

Table 5.31

Teacher Quality Findings

	Years Experience				Days Absent Percentage				Retention Percentage			
	Read		Math		Read		Math		Read		Math	
	All	Latino	All	Latino	All	Latino	All	Latino	All	Latino	All	Latino
Above APM	9.0	9.0	9.2	9.4	7.0	6.1	6.5	6.7	78.2	76.5	76.9	76.0
2	10.5	10.4	10.6	10.5	6.1	6.7	6.5	6.4	80.2	77.1	76.7	77.0
3	9.9	10.1	10.0	9.6	6.4	6.2	5.1	5.9	73.9	79.9	76.7	70.5
4	10.5	10.6	10.6	10.9	5.8	6.1	5.6	6.2	75.0	70.8	69.8	78.8
Below APM	9.8	10.1	10.8	10	6.8	6.1	6.4	6.2	74.6	76.0	77.8	74.3

Note. Data are reported as percentages and are the APM residual category means for the 2004-2005 school year.

Table 5.32

Ratio of Student to Professional Findings

	Teacher to Student				Administrator to Student				Counselor to Student			
	Read		Math		Read		Math		Read		Math	
	All	Latino	All	Latino	All	Latino	All	Latino	All	Latino	All	Latino
Above APM	19.0	18.8	18.1	17.1	281.3	279.6	276.8	269.2	297.5	432.5	383.8	392.2
2	18.4	16.7	19.3	19.3	267.4	266.2	262.9	304.4	356.0	403.7	412.0	397.6
3	18.3	19.6	19.5	18.7	287.5	296.0	296.5	277.0	346.2	347.5	330.5	382.7
4	19.0	19.0	17.7	18.6	326.0	304.7	264.7	301.8	475.5	516.6	471.6	419.7
Below APM	18.1	17.7	19.3	18.2	288.4	290.0	339.3	286.9	324.5	324.8	422.7	413.3

Note. Data are reported as percentages and are the APM residual category means for the 2004-2005 school year.

had the smallest and one of the smallest ratios between teachers and students. Across the four categories, the Ratio of Students to Administrators showed, for the most part, the smaller the ratio, the higher the achievement of students. Conflicting findings resulted from the ratio of students to counselors. With Reading All, the Top APM Residual category had much smaller counselor to student ratios. Math All and Math Latino American also demonstrated smaller counselor to student ratios. Inconsistent with the other three categories, Latino American Reading Above APM schools had a larger student to counselor ratio than the Below APM schools.

Findings for the years of Leadership Experience (see Table 5.33) were not substantial across the categories. Differences were noted for Reading All and Reading Latino American for the number of years the principal has been at the school. No other substantial findings were lucid in the Leadership Experience categories.

School-Level Conclusions

In conclusion, analyzing school performance on the CSAP, while adjusting for factors beyond the school's control, creates a less biased view of school achievement. Even though some of the far-reaching effects can not be completely removed from analysis, the use of APM allowed for a more accurate representation of student achievement to be examined. Understanding how schools perform when adjusting for factors beyond their control further enables educators and policy makers to make

Table 5.33

Leadership Experience Findings

	Years of Total Experience				Years at Current School			
	Read		Math		Read		Math	
	All	Latino	All	Latino	All	Latino	All	Latino
Above	6.5	5.5	5.8	5.2	3.6	2.8	3.2	2.2
2	2.4	5.2	4.3	6.7	1.8	3.3	2.4	3.9
3	5.9	4.5	5.3	4.4	3.5	3.5	3.9	2.2
4	4.4	5.2	7.1	5.2	2.7	1..8	2.9	3.2
Below	6.3	6.9	2.8	6.8	3.2	2.6	2.5	2.2

Note. Data are reported as percentages and are the APM residual category means for the 2004-2005 school year.

informed decisions on what works for All students and what works for Latino American students. The findings from this study, similar to the district-level study, demonstrates what works for All students is sometimes the same as what works best for Latino American students, and sometimes different.

Finally, the discussion in Chapter 6 presents overall conclusions from both district-level and school-level aspects. Furthermore, implications for the study and future recommendations are offered.

CHAPTER 6

IMPLICATIONS AND CONCLUSIONS

Being a member of a socially just society has lived inside me from my first thoughts of doctoral work through the completion of the process. As a public educator, I hear adults make excuses for certain students lack of academic success. Almost always, these cited excuses lay beyond the walls and control of educators. Through this research study, I purposely attempted to control the factors that fall beyond educator's control and focus solely on the areas we can control. The design was adapted from previous research by Leanna Stiefel, Amy Ellen Schwartz, Hella Bel Hadj Amor, and Dae Yeop Kim.

Using a research design that controls factors beyond the power of educators sends a significant message. Although I agree that factors such as socioeconomic status and students receiving special services have an influence on student learning, educators cannot change these factors. All students have a right to an adequate education. Creating a research study that discounts certain students achievement levels, contradicts my core beliefs. Therefore, this study was designed to focus solely on factors within the control of educators and I choose to discuss the findings through a social justice lens.

A socially just society includes educational systems that are able to focus solely on standards and accountability because society "members are physically and psychologically safe and secure" (Bell, 1997, p. 3) and equitable opportunities are a reality (Blanchett et al., 2005). Clearly, our society is not to this point yet. But, by taking responsibility for the factors educators *can* control, and focusing energies on fixing these areas rather than making excuses for factors beyond the control of educators, more progress toward educational adequacy can be achieved.

Conclusions About Findings

During the time of my proposal review and data collection, I felt fairly confident that my analyses would support the hypotheses that had driven my doctoral work. Although I am not completely satisfied with the story told through the study and the analyses within it, I am pleased to offer information, rich in quantitative data, to educators and policymakers. A list of schools achieving at higher levels and those achieving below expectation has not been recorded. If such a list were published, an inaccurate message might be received that this study was about punishing some schools and rewarding others. The intention of my doctoral work and this dissertation is to develop a broader understanding of the factors, within the control of educators, which might increase student achievement.

Although this study was designed with the best of intentions, it is impossible to understand the scope of the educational system in one study; schools and school

systems are too complex to be reduced to a few equations. This study was designed to address concerns about social justice through educational accountability. The public expects schools to be accountable for student achievement. Whereas I stand in the camp of educators who agree that educators should be accountable for student achievement, I also believe that it is unfair for schools to be penalized for factors beyond their control. Yet, if a population is underserved, then we are morally bound to seek redress. In the next three sections, conclusions of district-level and school-level findings, study limitations, and future study suggestions are offered. T-tests were administered to determine the statistically significant findings.

District-Level Conclusions

The findings from this study shed light on the factors, within district and school control, that have the greatest influence on student achievement as measured by the CSAP test. Table 6.1 displays three areas in which measurable differences were observed in factors within district control that affect student achievement. Interestingly, the three factors shown in Table 6.1 were all part of the Teacher Quality variable. The school districts with the highest residuals also employed teachers who, on average, had more years of teaching experience, held degrees in the content they were instructing, and earned higher salaries which sometimes is an indicator of advanced educational experiences.

Table 6.1

Factors Within School Districts' Control

	Years Experience		Degree Area		Salary	
	Above	Below	Above	Below	Above	Below
Reading-All	11.6	11.4	73.6**	72.9**	38,165	37,312
Reading-Latino	12.0**	11.6**	77.4	75.6	40,003	38,826
Math-All	12.0	11.3	76.4	73.0	37,713	36,350
Math-Latino	11.5	11.2	80.1**	75.5**	39,125*	39,605*

Note. Data are the APM residual category means for the 2004-2005 school year. * $p < 0.10$; ** $p < 0.01$.

Further, with Math achievement, differences were noted with the Ratio of Students to Professionals variable. The school districts with the highest Math residuals had the smallest teacher and student to administrator ratios (see Table 6.2).

Table 6.2

Math All Professionals to Student Ratios

	Professionals to Student Ratios	
	Teachers	Administrators
Above APM Districts	14.42	147.17*
Below APM Districts	15.58	169.74*

Note. Data are the APM residual category means for the 2004-2005 school year.
* $p < 0.01$.

Districts achieving the highest had teacher to student ratios of 14.42 students to every teacher, while the districts demonstrating the lowest achievement had ratios of 15.58 students to every teacher. Even more substantial were the differences in student to administrator ratios. The Above APM districts had student to administrator ratios of 147 students to every administrator compared with 170 students to every administrator in the Below APM districts. The findings for the Ratio of Students to Professionals in the Latino American Math and Reading categories were not as

substantial, suggesting that student ratios were not significantly different among the highest and lowest achieving districts.

Spending on Other Expenses was the third main area where district-level differences were noted (see Table 6.3). For purposes of this study, district spending was divided into (a) instructional expenses, (b) support services expenses, and (c)

Table 6.3

District Spending on Other Expenses

	Above APM Districts	Below APM Districts
Reading-All	18.5%	16.9%
Reading-Latino	21.8%	20.4%
Math-All	18.5%	16.9%
Math-Latino	22.6%	20.8%

Note. Data are the APM residual category means for the 2004-2005 school year. Findings shown in table are not statistically significant.

other expenses. The findings demonstrated that the districts in the Above APM category spent a greater percentage of their budget on Other Expenses than the districts in the Below APM category. The Other Expenses category includes services to the community such as recreation, child care programs, and other expenditures. A possible explanation for these findings could be that quality early educational options

and child care programs in the community have been closely linked to student achievement (Burke, C. & Burke, W, 2005; Monsaas, Kaste, Kettlewell, Zinsmeister, & Jones, 1998; Prince, Pepper, & Brocato, 2006). From a social justice angle, these findings suggest that districts with large underserved populations need teachers with teaching experience, degrees in the content area they are instructing, and completion of advanced educational degrees or programs. Furthermore, for math achievement, additional attention needs to be paid to maintaining smaller student to teacher and student to administrator ratios. Additional inquiry into understanding why districts in the Above APM category spent a greater percentage of their budget on Other Expenses is necessary for further recommendations in this area. Again, it is my hunch that these differences may have to do with resources being allocated for quality early childhood programs.

School-Level Conclusions

Similar to the district-level findings, the school-level findings also uncovered significant information. For example, across all four categories, the schools scoring in the Above APM category had the smallest enrollments during the 2003-2004 and 2004-2005 school years (see Table 6.4). The student enrollment numbers range from 710 to 748 students in the Above APM category compared to 930 to 1097 in the Below APM category. The smaller student enrollment numbers in higher achieving schools found across all areas may suggest that schools with smaller student

Table 6.4

School-Level Total Student Enrollment Numbers

	Read 03-04		Math 03-04		Read 04-05		Math 04-05	
	All	Latino	All	Latino	All	Latino	All	Latino
Above APM	744.5*	709.6*	734.8*	734.0	747.9	716.8	738.8	745.5
Below APM	1021.2*	1009.1*	1096.5*	957.5	984.8	976.5	1084.7	930.3

Note. Data are reported as percentages and are the high and low APM residual category means for the 2003-2004 and 2004-2005 school years. * $p < 0.01$.

enrollments are able to serve students better. Additionally, I believe that it is more likely for strong student and adult relationships to be formed in schools with fewer students because students are less likely to be unidentified and nameless.

Differences were also noted in Teacher Quality areas (see Table 6.5). Unlike the district-level findings, the school-level findings showed that the schools in the Above APM category employed teachers who had fewer years of experience than teachers in the other APM categories. These findings directly contradict the district-level findings. Remember, the schools included in the school-level analysis were from two large urban districts. It is fair to say that urban districts are currently experiencing a great deal of change in school reform attempts. I believe this contradiction may be understandable from the perspective that teachers who are new to the profession may be more willing to embrace change as many teacher education degree programs are now attempting to prepare teachers with innovative and reflective projects.

Further, the Above APM schools employed teachers who were absent at a higher rate. For the purpose of this study, the reason for teachers missing school was not gathered. My assumption is the higher absent rate may be caused by increased professional development opportunities.

Retention percentages were the third area of difference noted in the Teacher Quality area. When simply comparing the high and low APM categories, the Above APM schools retain teachers at a higher percentage than the Below APM schools do.

Retention rates were originally included in the study as a quantitative measure of school culture. The reasoning behind this variable was that whereas a student may not have the option to move schools, adults are not as likely to stay somewhere that is not a safe, secure, and enjoyable environment. The notion that the schools in the APM category demonstrating higher retention rates support the reasoning that these schools may provide safe, secure, and enjoyable environments where students feel comfortable enough to focus on learning.

Significant findings, see Table 6.6, were uncovered with Ratio of Students to Professionals. For instance, the Above APM schools had higher teacher to student ratios for Reading than the Below APM schools did. In contrast, for Math achievement the Above APM schools had smaller teacher to student ratios. The students to administrator ratios were smaller, across the four categories, for the Above APM schools than for the Below APM schools. Finally, the findings for counselor to student ratios contradicted one another. Reading achievement for all students clearly showed greater results with smaller student to counselor ratios. Math achievement followed a similar path with the Above APM schools having smaller ratios than the Below APM schools. Further, the Above APM schools for Latino American Reading demonstrated much higher counselor to student ratios than the Below APM schools showed.

Table 6.5

Teacher Quality Findings

	Years Experience				Days Absent Percentage				Retention Percentage			
	Read		Math		Read		Math		Read		Math	
	All	Latino	All	Latino	All	Latino	All	Latino	All	Latino	All	Latino
Above APM	9.0**	9.0**	9.2**	9.4**	7.0**	6.1	6.5*	6.7**	78.2*	76.5**	76.9	76.0**
Below APM	9.8**	10.1**	10.8**	10**	6.8**	6.1	6.4*	6.2**	74.6*	76.0**	77.8	74.3**

Note. Data are reported as percentages and are the APM residual category means for the 2004-2005 school year.
* $p < 0.10$; ** $p < 0.01$.

Table 6.6

Ratio of Student to Professional Findings

	Teacher to Student				Administrator to Student				Counselor to Student			
	Read		Math		Read		Math		Read		Math	
	All	Latino	All	Latino	All	Latino	All	Latino	All	Latino	All	Latino
Above APM	19.0*	18.8	18.1	17.1**	281.3	279.6	276.8	269.2*	297.5**	432.5	383.8	392.2
Below APM	18.1*	17.7	19.3	18.2**	288.4	290.0	339.3	286.9*	324.5**	324.8	422.7	413.3

Note. Data are reported as percentages and are the high and low APM residual category means for the 2004-2005 school year. * $p < 0.10$; ** $p < 0.01$.

Overall, from a social justice lens, the school-level findings may offer insight into creating adequate schools for all students. For example, in this study, it was clearly demonstrated that smaller schools are a benefit to student learning. Schools employing teachers with fewer years of experience proved to be a benefit in this study. A possible explanation for these possibly confusing findings could be that teachers newer to the profession may be more open to embracing change and innovative teaching methods that may be necessary when working with urban students. Additionally, schools in the above APM category employed teachers who were absent more often than teachers in the below category which may be explained by the teachers choosing to participate in more professional development opportunities. Above APM schools had higher teacher retention rates which may be an indication of working in safe and secure schools.

The district-level and school-level studies provided considerable information. As with any statistics, findings can be viewed from a variety of perspectives. Statistics can be a scary tool because people have a tendency to believe findings as absolute, when in actuality other factors may be contributing to the results. Although some of the findings were substantial, because of the study limitations I caution against drawing firm conclusions until additional inquires produce similar findings.

Study Limitations

Multicollinearity may have played a role in the analyses. In the final regression equations, the Part 1 standardized residuals correlated with the dependent variables with a range of -0.154 to 0.788 (see Appendix G- Appendix N). As mentioned earlier, multicollinearity can be problematic when variables are highly correlated. Variables that are too highly correlated are, in essence, measuring the same information which has the potential of skewing the results.

This study was restricted to school districts in one state and secondary schools in two metropolitan-area districts. A more comprehensive study might include a sampling from other major metropolitan areas in the United States. Another suggestion would be to include elementary schools in the school-level analysis. A third way to expand the sample would be to include more districts in the school-level analysis. A broader sample might provide more generalizeable findings.

Further, this study used only quantitative data. A mixed-method study would have offered greater depth of explanation about issues such as the use of resources because the qualitative aspect can provide explanations for the quantitative findings. At the end of this research study, I am left with many unanswered questions. Most of these questions might be answerable but only through additional exploration using both qualitative and quantitative data.

Future Studies

A very positive outcome of this study should spur further inquiries. The regression equations from this study had effect sizes ranging from 45% to 70% for the district-level analysis (see Table 6.7) and 45% to 71% for the school-level analysis (see Table 6.8). Although these findings offer significant information, the data reveals that other factors, beyond the scope of this study, apparently also affect student achievement.

As mentioned earlier, 30% to 55% of the variance within the analyses is unnamed at this time. Continuing to analyze the factors in this study, while including other potentially influential factors, would increase information for educators and policy makers. For example, developing an effective measure to determine a school's culture of expectations would be useful. The term *culture of expectations* refers to teachers' beliefs about students' ability level and students' values associated with intelligence and education. This would best be evaluated by developing a specific measure and using primary data collection methods.

A second possible study could involve analyzing school appropriations for professional development time measured against student achievement scores. Analyzing the most effective ways to use professional development time and measuring how this affects student achievement would add valuable information to the field. Understanding professional development and its effects on achievement is

Table 6.7

District-Level Conclusions

	R^2	Regression Variables
Reading All	45%	• Residual value from part one • Instructional leadership turnover • Ratio of Students to Other Professionals • Percentage of teachers instructing in degree area • Percentage of money spent on support services
Reading Latino American	54%	• Residual value from part one • Instructional leadership turnover • Percentage of days teachers are absent • Ratio of Students to Teachers and Administrators
Math All	60%	• Residual value from part one • Instructional leadership turnover • Ratio of Students to Teachers and Administrators • Percentage of teachers instructing in degree area • Percentage of money spent on support services
Math Latino American	70%	• Residual value from part one • Instructional leadership turnover • Instructional support turnover • Ratio of Students to Teachers and Administrators • Ratio of Students to Other Professionals • Percentage of days teachers are absent

Table 6.8

School-level Conclusions

	R^2	Regression Variables
Reading All	54%	• Part One Residual • Teacher Experience • Teaching Culture • Teacher Degree Area • Instructional Staff to Students • Leader Total Years of Experience • Leader Total Years at School
Reading Latino American	45%	• Part One Residual • Teacher Experience • Teacher Degree Area • Instructional Staff to Students
Math All	68%	• Part One Residual • Teacher Experience • Teacher Degree Area • Instructional Staff to Students • Leader Total Years of Experience • Leader Total Years at School
Math Latino American	71%	• Part One Residual • Teacher Experience • Teacher Degree Area • Instructional Staff to Students

particularly needed based on the findings of higher percentages of teacher absenteeism being associated with increased student achievement scores.

Because this is a single-state study, it raises a key question: What's next for schools in Colorado? The sections to follow include suggestions for improving education in Colorado, particularly secondary schools. Also, I make recommendations that I feel should be educators' and policy makers' next steps for improving education in Colorado.

The Need to Improve Education

Public education is at a critical junction. This social justice study focused on the factors districts and schools can control that have an influence on student achievement. In essence, the design of this study was born from the concept that school reform at the secondary level is needed. High schools have been basically the same for more than a century, designed to meet the needs of society fifty years ago (Gates, 2005; Sherry, 2005; Warner, 2004) and while they meet the needs of some students, the marginalization of many students continues.

Numerous studies have found many high schools in the United States graduate only about 60% of the students who enter their freshman year (Hartman, Schoales, & Besnette, 2003; Warner). Statistics focusing on schools serving Latino American youth are more dismal, typically showing rates of only 40% earning a diploma (Hartman et al.). Sustainable and meaningful change should align a school in ways

that the outcomes are demonstrated through high quality results reporting. In our current society, high quality results are demonstrated through measurements of student achievement. Schools are complex organizations that require the construction of equally complex reform systems.

Tackling Secondary School Reform

Education reform means seriously critiquing the current situation and discerning which elements and factors are getting in the way of student learning and changing them (Goodlad, 2004). For social justice reform, high schools need to embark on changes to be more relevant and rigorous (National Association of Secondary School Principals, 2005; Warner, 2004). Part of the perceived reluctance to tackle high school reform is the complexity of high schools (Olson, 2005a). Whereas successful changes in student performance can be achieved in an elementary school in about three years, it requires about six years for similar results to be achieved in a high school (Fullan, 2000). The public, policy makers, and educators need to be patient. School reform will not happen quickly or easily.

Rather than hedge charter schools versus voucher systems versus public schools, energy should be focused on collecting and using meaningful data to create systemic plans for improving schools. By focusing on improving schools, all students stand to gain rather than only benefiting the students enrolled in a particular type of school. Instead of working in isolation, conversations among stakeholders

need to happen frequently because change does not happen until a few people begin talking with one another about the possibilities of creating something different (Wheatley, 2002). Finally, educators and policymakers must be willing to act because, "if we don't act, nothing will change for the better." (Wheatley, 2002, p. 27)

Social Justice Suggestions for Colorado's Schools

Successful schools discover ways to adapt district initiatives into meaningful guidelines for the individual school and set high standards for their leaders, teachers, and students. Students' social, cultural, and life experiences are not blamed for failure in these schools but rather used to create relevance and build meaning in the classrooms. Quality instruction is the mission of the school with all decisions and actions supporting this focus. Principals act as instructional leaders making decisions based on data collected. In this study, districts and schools with smaller ratios of students to administrators often achieve higher results, which would support this assertion. Finally, successful schools focus on improving student attendance rates with the logic that students must be in school in order to increase their skills, achievement, and success.

Professional Teachers

Teachers are professionals who form the most important factor in educating students and need to be accountable for their students' learning. Findings from this study, such as the importance of teacher degrees in the area of instruction, support the

considerable role teachers' play in student learning. Because of findings from this study and others, careful hiring practices need to be in place in order to select certified, experienced, enthusiastic, and dedicated teachers (Jesse et al., 2004; Kannapel et al., 2005). Furthermore, to pursue the social justice goal, the highest quality teachers are need in the lowest achieving schools.

Teacher schedules need time for collaboration, reflection, and planning. Whereas time within the school day is essential for collaboration, time beyond this structure is needed. The schools achieving in the Above APM category had higher teacher absenteeism rates. My assertion is that this increase in absences may be due to professional development within the school day. Educators must have the opportunity to push themselves to become more effective by participating in embedded, systemic professional development opportunities (Jesse et al., 2004).

National board certification is another reputable option for professional development that many educators aspire to reach. National board certification is a professional development opportunity for teachers wishing increase their qualification to be certified to teach anywhere in the nation. Earning this certificate moves a teacher into a prestigious category among educators in addition to providing, on average, a 10% increase in salary for ten years until the certificate must be renewed (MacDonald, 2005). Oklahoma proposed adding the stipulation of working in low-performing schools to the list of requirements for those wishing to earn national board certification (MacDonald). Passing and implementing a bill like this in Colorado

would be an avenue to increase the number of high-quality teachers working in the neediest schools (MacDonald).

Essential Leadership

Leadership contributed to the regression equations for this study. Strong leadership is crucial to sustainable school reform. Leaders must be prepared to handle complex and rapidly evolving environments (Fullan, 2002). Selecting the best-suited individual to be the principal of each school is arguably the most important decisions school districts make. A principal's job description must shift from the too often traditional role of a business manager to the innovative role of an instructional leader. Instructional leaders charge themselves with providing the best educational opportunities for teachers and students (Fullan; Weiner et al., 2000).

With traditional structures, many leaders were not effectively able to perform each role expected of them. Some districts and schools may be restructuring the leadership duties to be more effective leaders. For example, to allow principals to work as instructional leaders, schools in Chicago hired business managers who were placed in low-performing schools with the intent of allowing the principals to work as instructional leaders (Hansen, 2004). This may be a potential explanation of this study's findings that the highest performing districts and schools were likely to have the smallest ratios of students to administrators.

Leaders need to have the option to rethink the educational environment and make changes to create more conducive conditions and they need flexibility, authority, and responsibility when making decisions surrounding hiring and firing of staff members, professional development, instructional design, and scheduling and budgeting (Denver Commission on Secondary School Reform , 2005). For instance, extended time blocks are often necessary to allow for increased student engagement instead of a more traditional, shorter class period (Jesse et al., 2004; Weiner et al., 2000). Strong leaders provide opportunities for team-teaching, special focus teams, teacher collaboration, curriculum development, professional development both inside and outside of school, and a restructured workday to permit more professional interaction (Weiner et al.). Improving and achieving schools have a consistent instructional environment in which the school day revolves around instruction and learning (Gordon, 2004b). Finally, leaders must align their school standards to support specific reform measures rather than attempting to accomplish too many changes at one time (Russo, 2004).

Smaller Schools

Support for smaller schools was evident in the school-level analysis of this study. High schools need to become more personalized, relevant, and rigorous (Besnette & Schoales, 2004; Denver Commission on Secondary School Reform, 2005; Warner, 2004). By increasing school-level flexibility, educators will be able to

offer the personalized services for their students to be successful. Reorganizing large schools and creating smaller schools can be a step in decreasing the number of marginalized students who go unnoticed in schools.

Relationship building is of paramount importance in serving Latino American students (Cavanagh & López, 2004; Hernandez & Nesman, 2004; Jesse et al., 2004 Sadowski, 2005). Smaller schools allow for more personal attention to ensure students are fully engaged in learning and connecting with at least one adult in the school. School employees need to be adults who believe that all children can learn and be successful.

Successful teachers resoundingly stress the importance of establishing a relationship with students before any quality learning will take place (Delpit, 1995a). Students recognize the significance of having teachers dedicated to spending time with them in addition to teaching them the subject matter. Educational environments centering on building relationships are pleasant learning and working atmospheres. Students need to be treated as important and valuable people.

Include the Family

Although this study did not measure family involvement, it is the schools' responsibility to find ways to engage parents and community members in all phases of school operations (Montecel et al., 2004). Social justice requires the inclusion of all participants. With this in mind, some educators may need to shift their collective

attitude into believing that parents are doing the best they can and then they need to clearly convey this to the parents they serve. It is necessary to establish relationships with each student's family early in their students educational experience and then continue to build rapport upon that initial connection.

Some parents believe that the teachers are the experts and that if the teacher recognizes an issue with their child, then the teacher would call them. In essence, no news from the teacher is good news. By developing programs for parents to learn about the situations that affect their children's lives at school can increase parent's comfort level with the school, while also encouraging more involvement (Kidder, 2005; Denver Commission on Secondary School Reform, 2005).

Student Accountability for Social Justice

No Child Left Behind (NCLB) law has brought greatly needed public attention to the academic divide glaringly apparent in schools (Flannery & Jehlen, 2005). Whereas publishing embarrassing statistics and slashing funds will not improve education, it can influence the public's opinion, convincing them that change is necessary for schools (Olson, 2005b). Keeping districts and schools responsible for factors within their control, such as incorporating APM into an accountability system, may be an answer to more accurate, fair, and consistent standards.

The dropout issue must be addressed. Although this aspect was not addressed in this study, it is a social justice issue of pressing concern. Initiating a student

identification system would allow the state to track student achievement, student attendance, and student mobility (Blake, 2005; Colorado Children's Campaign, 2005; Schramm & Besnette, 2003). A standard statewide calculation method would be the second step in tackling the dropout issue because it would determine an accurate count on the number of graduates and dropouts (Hayes & Polis, 2005).

Finally, power must be given at the local levels where educators know their student population, culture, and needs (Goodlad, 2004). The findings from this study can be used as a starting point to determine appropriate interventions or reform targets. Once these interventions are selected, local educators need to collect meaningful data indicators to subjectively determine if the reform effort is working. Interventions showing no significant effect over time should be removed. In essence, educators must take responsibility for all students cumulative learning experience and not simply for the happenings in their specific classroom (Steinberg, 1998b).

Educational Expectations

Until students are held to higher, more rigorous standards in the classroom, graduates will not successfully meet the demands of society and progress towards the goal of social justice is not made (Darling-Hammond, 2004; Denver Commission on Secondary School Reform, 2005). Lowering expectations with the intention of helping certain students succeed is actually harming students tremendously because students will raise, or lower, their standards in relation to the set expectations

(Conchas, 2001; Garcia & Guerra, 2004; Hansen, 2004). Former United States Secretary of Education Rod Paige has named this issue of asking for less from students in the misguided belief of helping the student as "soft bigotry of low expectations" (2003, section 1, paragraph 26).

Further, Latino American students do not need rescuing; they need knowledge, information, and transferable skills to liberate themselves (Montecel et al., 2004). Many parents articulate a desire and an expectation of schools to prepare their children for success in American society. This expectation requires teachers to instruct students in ways that teach children conventional reading, writing, and speaking skills, rather than allowing students to write and speak using slang language (Delpit, 1995).

P-16

While this study focused on schooling at the secondary level, the thought-patterns for curriculum articulation and alignment should evolve from K-12 to an extended P-16 (Colorado Children's Campaign, 2005). Eight states in the United States, including Colorado, have no course requirements when granting a high school diploma (Kelderman, 2005). Currently, only five states require students to complete four years of Math, and just six states require students to complete four years of grade-level English (Honawar, 2005; Kelderman). Though no policy has been made for high school graduation requirements, the Colorado Commission on Higher Education has approved statewide admission requirements to attend all of Colorado's

public four-year universities (Hartman et al., 2003). In addition to setting mandatory course requirements for earning a high school diploma, schools need to be held accountable for assisting every student in developing a plan for post-secondary education options (Colorado Children's Campaign, 2004: Honawar).

Curriculum Standards

Clear standards for all students should be widely communicated, ensuring that concerned individuals have an understanding of expectations and educators are accountable for providing supports for students to reach these standards (Gates, 2005; Makkonen, 2003). Classroom instruction needs to go deeper into a few areas, rather than attempting to cover too many topics in a very shallow manner (Denver Commission on Secondary School Reform, 2005). Depth allows students to reflect and construct their own knowledge on the material they are learning rather than simply regurgitating surface-level information (Gordon, 2004b).

High standards and expectations must be placed upon all students. In fact, students will learn more when taught using demanding curriculum than if these students are taught less-challenging material (Banks et al., 2001; Ennis & McCauley, 2002). President George W. Bush stated, "if you have low standards for every child, don't be surprised at what you get. High standards don't set our children on a path to failure. High standards set our children on a path to success" (Sanger & Rutenberg, 2004, p. 2). All students deserve to receive challenging work that will prepare them for post-secondary education or work (Gates, 2005; Denver Commission on

Secondary School Reform, 2005; Rodrigues, 2004). Students should be required to complete four years of grade-level appropriate English and Mathematics at least through Algebra II in order to earn their diploma (Honawar, 2005;Olson, 2005a; Stanford, 2004; Swail, 2004). All students deserve rigorous content and lots of support to be successful.

Literacy, Literacy, Literacy

Literacy must be a focal point in each and every classroom because it is a necessary building block for comprehension in all content areas. Rothman (2005) concluded, in an adolescent literacy study, that "United States' fourth graders outperformed those from almost every other nation, and two-thirds performed above the international average. . . reading literacy among 15-year-olds in 2000, only half of United States students performed above the international average" (p. 1). Without proficient reading and writing skills, a student will not be able to master any other academic subject (Weiner et al., 2000). In fact, a reading deficiency often prohibits a student from completing more demanding work (Spellings, 2005).

Acknowledge the Changing Society

An underlying theme of this study was that educational experiences may be different in districts and schools serving high percentages of Latino American students. It should be clear that "classrooms in the United States are changing"

(Freeman, 2004, p. 7). One aspect of embracing all cultures requires acknowledging differences, inequality issues, and cultural norms.

Because school environments are often snapshots of society, all perspectives need to be included in the environment to be active participants in a socially just society (Cruz, 1999). With the changing society, purposeful incorporation of multiple cultures into the curriculum, allows for additional cultures to become mainstreamed in the overall school environment (Téllez, 2004; Walters, 1998). In addition, providing opportunities in which students are able to generate their own cultural knowledge can be invaluable. An example of this "self-generated knowledge" (Amster, 1994) would be to send students to grocery stores in different areas of a city inhabited largely by people from cultures unlike their own to compare the quality of selection, foods, and to log interactions with employees and other customers. Constructed knowledge of inequities, realized from personal events, create powerful learning experiences and contribute to the social justice movement. School leaders have a responsibility to generate cultural conversations in order to help marginalized populations feel more visible (Amster, 1994; Santos, 2004).

Final Thoughts

My final thoughts come down to the need to initiate conversations about the way resources are distributed throughout Colorado's schools. "The passions that drive our most committed educators in their work have not changed, but the

landscape in which they are working to achieve these goals is changing rapidly" (Sadowski, 2004, p. 1). Professional development must be available, with adequate resources, for teachers to receive what they need to help students achieve academically, socially, and emotionally.

Educators can only control the school environment. "While poverty, family, neighborhood, and other factors affect student success, school systems must never use these conditions as excuses, but rather recognize them and help students succeed in spite of them" (Denver Commission on Secondary School Reform, 2005, p. i). Policy makers' and educators' focus needs to center on school-environment deficiencies and not extend to student-based issues (Haycock, 2001; López, 2001; Shreffler, 1998; West, 1993).

Because of the rapidly changing student population, Latino American students' achievement needs to be a priority of educational policy makers. Further, policy makers need to overhaul the current practice of evaluating districts and schools solely on test scores. Instead, policy makers should adopt a practice, such as APM, of assessing districts and schools on the factors that they can control. Such practice would provide a more accurate account of high-achieving districts and schools.

Appendix A

Means, Standard Deviations, and Intercorrelations for Uncontrollable Factors (N = 178)

Variable	*M*	*SD*	1	2	3	4	5
1. Free and reduced lunch percentage	0.383	0.317	-				
2. Special Education percentage	0.109	0.170	0.000	-			
3. English Language Learners percentage	0.069	0.094	0.004	0.439	-		
4. Per Pupil Revenue	0.071	0.061	0.000	0.000	0.002	-	
5. Revenue from Federal	8890.02	2311.44	0.001	0.014	0.039	0.003	-

Appendix B

Means, Standard Deviations, and Intercorrelations for School Environment (N = 178)

Variable	*M*	*SD*	1	2	3	4
1. District administrators	0.225	0.312	-			
2. Building administrators	0.231	0.301	0.144	-		
3. Teachers	0.171	0.092	0.141	0.411	-	
4. Instructional supporters	0.242	0.253	-0.004	0.100	0.109	-

Appendix C

Means, Standard Deviations, and Intercorrelations for

Ratio of Professionals (N = 178)

Variable	*M*	*SD*	1	2
1. Students to teachers	13.850	3.679	-	
2. Students to building administrators	149.184	58.191	0.672	-

Appendix D

Means, Standard Deviations, and Intercorrelations for

Student Characteristics (N = 84)

Variable	*M*	*SD*	1	2
1. Free and reduced lunch percentage	0.407	0.319	-	
2. English Language Learners percentage	0.070	0.091	0.693	-

Appendix E

Means, Standard Deviations, and Intercorrelations for Teacher Quality (N = 85)

Variable	*M*	*SD*	1	2	3	4
1. Years of teaching experience	9.950	2.326	-			
2. Days absent	0.061	0.016	0.005	-		
3. Salary	46776.23	3475.29	0.850	-0.098	-	
4. Teacher retention	0.765	0.117	0.280	-0.249	0.433	-

Appendix F

Means, Standard Deviations, and Intercorrelations for

Ratio of Professionals (N = 85)

Variable	*M*	*SD*	1	2
1. Students to teachers	18.064	3.921	-	
2. Students to building administrators	275.300	91.953	0.712	-

Appendix G

District-Level Intercorrelations, Reading All (N = 155)

Variable	1	2	3	4	5
Read All CSAP, 2004-2005 Advanced and Proficient	0.636**	0.178*	0.141*	-0.138*	-0.242**
Predictor variable					
1. Read All, Part 1	-	0.088	0.015	0.093	0.255**
2. Student to Other Professionals Ratio		-	0.325**	-0.011	-0.080
3. Teacher Degree Area			-	-0.028	0.034
4. Money Spent on Support Services				-	0.062
5. Instructional Leadership Turnover					-

Note. $R^2 = 45\%$, * $p < 0.05$; ** $p < 0.01$.

Appendix H

District-Level Intercorrelations, Reading Latino (N = 80)

Variable	1	2	3	4
Read Latino CSAP, 2004-2005 Advanced and Proficient	-0.154	0.729*	0.117	0.277*
Predictor variable				
1. Read Latino, Part 1	-	-0.096	0.027	-0.030
2. Instructional Leadership Turnover		-	-0.031	0.350*
3. Days Teachers Absent			-	-0.288*
4. Student to Teacher and Administrator Ratio				-

Note. $R^2 = 54\%$, $^*p < 0.01$.

Appendix I

District-Level Intercorrelations, Math All (N = 154)

Variable	1	2	3	4	5
Math All CSAP, 2004-2005 Advanced and Proficient	0.741*	-0.216*	0.156**	-0.189*	0.075
Predictor variable					
1. Math All, Part 1	-	-0.168**	0.091	0.032	-0.083
2. Instructional Leadership		-	0.036	0.055	0.065
3. Teacher Degree Area			-	-0.028	0.025
4. Money Spent on Support Services				-	-0.303*
5. Student to Teacher and Administrator Ratio					-

Note. $R^2 = 60\%$, * $p < 0.05$; ** $p < 0.01$.

Appendix J

District-Level Intercorrelations, Math Latino (N = 79)

Variable	1	2	3	4	5	6
Math Latino CSAP, 2004-2005						
Advanced and Proficient	0.788	-0.166	0.119	-0.012	-0.041	0.370**
Predictor variable						
1. Math Latino, Part 1	-	0.004	-0.105	-0.091	-0.118	0.299**
2. Instructional Leadership		-	-0.264**	0.027	0.327*	-0.031
3. Student to Other Professional Ratio			-	-0.186*	-0.173	0.197
4. Teacher Absent Days				-	-0.127	-0.286*
5. Instructional Support					-	0.117**
6. Student to Teacher and Administrators Ratio						-

Note. $R^2 = 70\%$, $^*p < 0.05$; $^{**}p < 0.01$.

Appendix K

School-Level Intercorrelations, Reading All (N = 81)

Variable	1	2	3	4	5	6	7
Reading CSAP, All	0.369**	0.485**	-0.347**	-0.490**	0.447**	-0.071	0.227*
Predictor variable							
1. Part 1 Residual	-	0.134	-0.261**	-0.117	0.039	0.225*	0.189*
2. Teacher Experience		-	-0.095	0.369**	0.339**	-0.073	0.170
3. Teaching Culture			-	-0.199*	-0.197*	0.209*	0.109
4. Teacher Degree Area				-	0.329**	-0.004	0.013
5. Instructional Staff to Students					-	-0.052	0.109
6. Leader Total Years of Experience						-	0.304**
7. Leader Total Years at School							-

Note. $R^2 = 54\%$, * $p < 0.05$; ** $p < 0.01$.

Appendix L

School-Level Intercorrelations, Reading Latino (N = 72)

Variable	1	2	3	4
Reading CSAP, Latino American	0.268*	0.468*	0.478*	0.533*
Predictor variable				
1. Part 1 Residual	-	0.163	-0.048	0.175
2. Teacher Experience		-	0.307*	0.312*
3. Teacher Degree Area			-	0.331*
4. Instructional Staff to Students				-

Note. $R^2 = 45\%$, $^*p < 0.01$.

Appendix M

School-Level Intercorrelations, Math All (N = 80)

Variable	1	2	3	4	5	6
Math CSAP, All	0.545**	0.446**	0.377**	0.373**	-0.082	0.215*
Predictor variable						
1. Part 1 Residual	-	0.068	-0.225*	-0.099	0.126	0.159
2. Teacher Experience		-	0.319**	0.299**	-0.091	0.177
3. Teacher Degree Area			-	0.283**	-0.022	0.014
4. Student to Instructional Staff Ratio				-	-0.067	0.112
5. Leader Total Years of Experience					-	0.304**
6. Leader Total Years at School						-

Note. $R^2 = 68\%$, * $p < 0.05$; ** $p < 0.01$.

Appendix N

School-Level Intercorrelations, Math Latino (N = 71)

Variable	1	2	3	4
Math CSAP, Latino American	0.675*	0.348*	0.188	0.369*
Predictor variable				
1. Part 1 Residual	-	0.107	-0.287*	-0.007
2. Teacher Experience		-	0.311*	0.309*
3. Teacher Degree Area			-	0.345*
4. Instructional Staff to Students				-

Note. $R^2 = 71\%$, * $p < 0.01$.

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